cc: 401 N. Mine La Monte St.
Fredericktown, Mo 63645

MO-0000100089

Date: July 29, 1983

Subject: Preliminary Assessment of Anschutz Mining Corporation Madison Mine - Fredericktown, Missouri

From: Patrick Costello, SPFD

To: Katie Biggs, SPFD Chief

Background and Site History.
This site was identified as a potential hazardous waste site in June of 1981 by National Lead Industries which had mined the property (lead, cobalt, nickel, and copper) from 1942 until 1961.

The first mine shaft was sunk at the Madison Mine site in 1844. Since then, the property has gone through several changes of ownership. Currently the Anschutz Mining Corporation owns the tract and no mining operations are currently in progress. The mines are being dewatered and the company did have an NPDES permit but it has expired. A new proposed permit is under review by the State's Water Pollution Control Program.

In November of 1980, EPA received a citizen's complaint that hazardous wastes were being deposited in mine shafts at the site. MDNR inspected the mine in December of 1980 and found no evidence of illegal waste disposal at the site. Water from the mines showed no evidence at the time of chemical contamination.

In March 1977, a dam between the southern tailings pond and Tollar Branch Creek collapsed after a heavy rain. Water and tailings flowed into Tollar Creek, Saline Creek, and the Little St. Francis River. A study following this event indicated that heavy metal concentrations did not exceed safe limits for invertebrates of concern and that such concentrations during the study never approached acute toxicity levels set by the EPA. Also, no dead fish were observed following the collapse.

A new dam was built and is 8 to 10 feet higher than the old dam and is made of rock. The structural integrity of this new dam is much improved and as such, should prevent release of tailings from the southern tailings pond.

Visual inspection of the site area showed evidence of plentiful vegetative cover except on the surface of the tailings piles themselves. There is no visible damage to the area downstream of the site according to the TAT inspection which was conducted along with MDNR on January 25, 1983. As for now, Anschutz is legally required to obtain a tailings pond permit from MDNR to certify the structural integrity of the dam. Under regulations, Anschutz has six years to obtain this permit.

Based upon available information, I recommend that there be no further action on this site.

Agree

Disagree_____

Comment_____....

JOHN ASHCROFT
Governor

FREDERICK A. BRUNNER
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Division of Energy
Division of Environmental Quality
Division of Geology and Land Survey
Division of Management Services
Division of Parks and
Historic Preservation

MEMORANDUM

DATE: September 26, 1986

TO: June Sullens, Environmental Specialist
Waste Management Program

FROM: Greg Pavely, Environmental Engineer
Poplar Bluff Regional Office

SUBJECT: Site Investigations

Please find enclosed the complete Site Investigation report and H.R.S. Scoring package for Anschutz Madison Mine.

A Site Investigation for Day's Sales will be forthcoming soon after sample results are received by this office.

If you have any questions, please advise.

GP/sw

Appendix # 7

EPA Form 2070-13

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION
01 STATE: 29 | 02 SITE NUMBER: MOD098633415

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Anschutz's Madison Mine	East Marvin Avenue				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Fredericktown, MO	MO	63645	Madison	203	08

09 COORDINATES: LATITUDE 37 32 24.9 | LONGITUDE 90 16 39.7

10 TYPE OF OWNERSHIP (Check one): ☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
02,28,86 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1847 (BEGINNING YEAR) 1984 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply):
☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☒ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Gregory Pavely	Environmental Engineer	MDNR	(314) 785-0832
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Rich Roberts P.E.	Environmental Engineer	MDNR	(314) 785-0832
Sam Brenneke	Environmental Specialist	MDNR	(314) 751-7929
Bill Johnson	Laboratory Technician	MDNR	(314) 751-7929
Joe Rowe	Environmental Specialist	MDNR	(314) 751-3026
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Douglas Boscheinen	Project Manager	2400 Anaconda Tower 555 Seventeenth St	(307) 298-1000
		Denver Colorado 80202	( )
Ken Lashley	Caretaker	East Marvin Ave. Fredericktown, MO 63645	(314) 783-5127
			( )
		SUPERFUND	( )
		JAN 26 1987	( )
		SITE LOG	

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	9.00 AM	Clear & Cool

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Greg Pavely	MO Dept. Nat. Res	(314) 786-0832

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Greg Pavely	MDNR	MDNR	314-785-0832	9, 10, 86 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

JAN 27 1987

CERCLIS

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
29	MO1009863415

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE
(Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS unknown
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☒ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			amount unknown
OLW	OILY WASTE			amount unknown
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			amount unknown
BAS	BASES			
MES	HEAVY METALS			amount unknown

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	Silver	7440-22-4	impoundment	60	ppb
MES	Chromium	7440-47-3	impoundment	270	ppb
MES	Lead	7439-92-1	impoundment	28000	ppb
MES	Arsenic	7440-38-2	impoundment	1800	ppb
MES	Cadmium	7440-43-9	impoundment	320	ppb
IOC	cyanide	57-12-5	impoundment	0.1	ppm
OLW	PCB-1254	1336-36-3	impoundment	240	ug/kg

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis reports)

State files
Laboratory Data
1979 Registry of Toxic Effects of Chemical Substances - NIOSH

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
29	MO1009863345

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 1210
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
No samples have been taken but shallow wells in the area are suspect

01 ☒ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 5460
02 ☐ OBSERVED (DATE: 2/25/86) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION
Population is total for a 3 mile area. Stream runs through Fredericktown.

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED. _____
02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NA

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE. _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NA

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED. _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NA

01 ☒ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: 1800 (Acres)
02 ☒ OBSERVED (DATE. 2/25/86) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION
Site is 1800 acres. All is potentially contaminated

01 ☒ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 1210
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Total population served by groundwater

01 ☒ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED. Unknown
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION
Workers for Fulon Bridge are on site occassionally.

01 ☒ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED 5460
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Total population for a 3 mile area. Contact possible

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: 29 | 02 SITE NUMBER: MOD099633415

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☒ OBSERVED (DATE 2/25/86) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION
Most of site area is void of vegitation

01 ☒ K. DAMAGE TO FAUNA — 02 ☒ OBSERVED (DATE: 2/25/86) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)
Mead worms were photographed in drainage

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NA

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☒ OBSERVED (DATE 2/25/86) ☐ POTENTIAL ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION
Leaking surface impoundments and contaminated drainage

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Contaminated surface water.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NA

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☒ OBSERVED (DATE 2/25/86) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION
PCB's found in drainage

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
None

III. TOTAL POPULATION POTENTIALLY AFFECTED: 5460

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis reports)
Site visit
State files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
29	MOD098633415

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☒ A. NPDES	MO-0098752		12-2-1982	Not related to contamination
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☒ A. SURFACE IMPOUNDMENT	unk.	
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCINERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

☒ A. BUILDINGS ON SITE

06 AREA OF SITE

1800 (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☒ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC

Old tailings piles are not lined and the dams are cut away so liquids can drain

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

Area is fenced but it is very large and accessible

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Site inspection

State files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
29	MOD096734115

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL
COMMUNITY	A. ☒	B. ☒
NON-COMMUNITY	C. ☐	D. ☒

02 STATUS	ENDANGERED	AFFECTED	MONITORED
	A. ☐	B. ☐	C. ☒
	D. ☐	E. ☐	F. ☒

03 DISTANCE TO SITE
A. 2.5 (mi)
B. 0.1 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 1210

03 DISTANCE TO NEAREST DRINKING WATER WELL 0.1 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
30-40 (ft)	west	30-40 (ft)	(gpd)	☐ YES ☐ NO

09 DESCRIPTION OF WELLS (Including use, depth, and location relative to population and buildings)
Residential wells are shallow and poorly constructed. Deep City wells are not suspected to be contaminated.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS	☒ YES ☐ NO	COMMENTS: all streams in the area are gaining

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
	☐	(mi)
Little St. Francis River	☐	2.1 (mi)
Saline Creek	☐	1.0 (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 2044 NO OF PERSONS	B. 4531 NO OF PERSONS	C. 5460 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION
0.1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
unknown

04 DISTANCE TO NEAREST OFF-SITE BUILDING
0.1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)
Fredericktown is a small city of 3500 people located in the old lead belt of Missouri. Water is drawn from a resivior serving 3700 people and a deep well serving 560 people.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
29	MOD099673415

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☒ A. $10^{-6} - 10^{-8}$ cm/sec ☒ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☒ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
30-50 (ft)	unk. (ft)	unk.	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
7 (in)	3.1 (in)	5-15 %	west	2-3% %

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. NA (mi)	B. NA (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

NA (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS, NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. 0.1 (mi)	B. 0.1 (mi)	C. None (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site Topography has been significantly altered by mining activities. Area is hilly with some slopes exceeding 12%. Site is 1500 acres with many small tailings piles and ponds. All surface water is suspected to eventually drain into Saline Creek.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

DGLS Report.

State files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
29	MOD098C33415

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER	2	DNR Lab in Jeff City and Wilson Labs. Salina	8-25-86
WASTE			
AIR			
RUNOFF	1	DNR Lab in Jeff City and Wilson Labs. Salina KS	8-25-86
SPILL			
SOIL	5	DNR Lab in Jeff City and Wilson Labs. Salina KS	8-25-86
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
PH of Acid liq.	PH was 1.5-2.0 which will bring metals into solution

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF MDNR Poplar Bluff
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Mo. D.N.R. Poplar Bluff

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

None

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Site visit.
Laboratory Results in State files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
29	MOD098633415

II. CURRENT OWNER(S) / PARENT COMPANY (If applicable)

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 NAME: Anschutz Mining Corporation		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): 2400 Anaconda Tower 555 17th St.		04 SIC CODE: 106-1061	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY: Denver Colorado	06 STATE: CO	07 ZIP CODE: 80202	12 CITY:	13 STATE:	14 ZIP CODE:
01 NAME:		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	12 CITY:	13 STATE:	14 ZIP CODE:
01 NAME:		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	12 CITY:	13 STATE:	14 ZIP CODE:
01 NAME:		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	12 CITY:	13 STATE:	14 ZIP CODE:

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable; list most recent first)		
01 NAME: National Lead		02 D+B NUMBER:	01 NAME:		02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): 314 N. Broadway		04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:
05 CITY: St. Louis	06 STATE: MO	07 ZIP CODE:	05 CITY:	06 STATE:	07 ZIP CODE:
01 NAME:		02 D+B NUMBER:	01 NAME:		02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	05 CITY:	06 STATE:	07 ZIP CODE:
01 NAME:		02 D+B NUMBER:	01 NAME:		02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	05 CITY:	06 STATE:	07 ZIP CODE:

V. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
29	MOD098633445

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
None			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER		

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		
01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		
01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
29	MOD099633416

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
Anschutz Mining Corp.	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
2400 Anaconda Twr. 555 17th St	

05 CITY	06 STATE	07 ZIP CODE
Denver	CO	80202

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
None			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
None			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
29	MOD0 96633416

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED 04 DESCRIPTION NA	02 DATE	03 AGENCY
01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ C. PERMANENT WATER SUPPLY PROVIDED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ D. SPILLED MATERIAL REMOVED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ E. CONTAMINATED SOIL REMOVED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ F. WASTE REPACKAGED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ H. ON SITE BURIAL 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ I. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ L. ENCAPSULATION 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ N. CUTOFF WALLS 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION	02 DATE	03 AGENCY

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
29	MOD099633415

II PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED 04 DESCRIPTION NA	02 DATE	03 AGENCY
01 ☐ S. CAPPING/COVERING 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ T. BULK TANKAGE REPAIRED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ U. GROUT CURTAIN CONSTRUCTED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ V. BOTTOM SEALED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ W. GAS CONTROL 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ X. FIRE CONTROL 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ Y. LEACHATE TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ Z. AREA EVACUATED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ 1. ACCESS TO SITE RESTRICTED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ 2. POPULATION RELOCATED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ 3. OTHER REMEDIAL ACTIVITIES 04 DESCRIPTION	02 DATE	03 AGENCY

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
29	MOKO 9863341 15

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

APPENDIX VIII

TAT-07-F-00093

MADISON COUNTY MINE
HAZARD ASSESSMENT

TDD #07-8212-07

Date: June 21, 1983

Prepared by: Helen L. Holm

Region VII Technical Assistance Team

TABLE OF CONTENTS

APPENDICES

INTRODUCTION

This report includes the results of a preliminary assessment and inspection of the Anschutz Mining Corporation Madison Mine located near Fredericktown, Missouri. This inspection was authorized under Technical Direction Document #07-8212-07.

The site was identified as a potential hazardous waste site in June of 1981. The site was listed as a potential hazardous waste site #MO-000000 433.

The Madison Mine property is located southeast of Fredericktown, Missouri, in Township 33N and Range 7E in Sections 16, 20, 21, 26, 27, 28, 32, and 33.

TECHNICAL BACKGROUND

Geology

There are various types of soils in and around the plant. Goss soil is the major type of soil in the steeper area near the site. This type of soil has a permeability of 0.6 to 2.0 inches per hour. There is also a layer called fragipan that lies within 2 feet of the soil surface with a significantly lower permeability; the common permeability range of fragipan is 0.06 to 0.2 inches per hour. The soils information was obtained from Burton Brown, Soil Scientist in the Farmington, Missouri Soil Conservation Service Office, who has done considerable soil sampling in the Madison County area.

Depth to bedrock in the Fredericktown area ranges from a few feet down to 185 feet. The best aquifer in the area is the Lamotte sandstone. Smaller amounts of water are found in the Bonneterre dolomite that overlies the Lamotte layer. Generally, the Lamotte sandstone lies on top of a layer of igneous rock, but in a few places, the Lamotte layer is not present. Therefore, the depth to groundwater varies greatly in the Fredericktown area. These facts were obtained from Don Miller, Chief of the Water Resources Data & Research Department of Missouri Geology and Land Survey Division of the Missouri Department of Natural Resources.

According to Mr. Owen Slankard, Fredericktown City Utilities Manager, the closest wells to the Madison Mine site are located in Cobalt Village. Mr. Harry Mason, a long-time resident of Cobalt Village, said the average depth of wells in the Cobalt Village area ranges from 75 to 100 feet. Clifford Pense of Pense Brothers Drilling said that wells in that area are not normally deeper than 100 to 120 feet. Information on the direction of groundwater flow and aquifer supply could not be obtained.

Critical Habitat

Mel Zielinski, area agronomy specialist with the Missouri Cooperative Extension Service, provided a list of endangered species in Madison County. There are 22 endangered species in the county. These include invertibrates, mussels, plants, a type of insect, and one type of fish. Mr. Mike Martin, regional service agent with the Missouri Conservation Agency, and Dr. Jim Wilson, Endangered Species Coordinator of the Missouri Department of Conservation Natural History section were contacted regarding the exact distance of endangered species from the site. Both of them said that such specific information is not available. According to Dr. Wilson, the Missouri Department of Natural Resources has not developed such information due to the difficulty of establishing exact boundary lines for the ranges of endangered species.

Site Location

The Madison Mine site is located approximately 1/4 mile southeast of Fredericktown, Missouri, and directly east of Cobalt Village, Missouri. The population of Fredericktown is approximately 4,000 and the population of Cobalt Village is approximately 250.

The Tollar Branch is an intermittent creek that flows from the Madison Mine site through Fredericktown and then into Saline Creek. Surface water discharge from the southern tailings pond would flow into the Tollar Branch. Surface water discharge from the northern tailings pond would flow into an intermittent creek that also flows into Saline Creek. Saline Creek flows into the Little St. Francis River. The Fredericktown water supply is a city lake on the Little St. Francis River upstream of the point where Saline Creek flows into the Little St. Francis River. Saline Creek is a source of water for livestock.

SITE HISTORY

The first mine shaft was sunk at the Madison Mine site in 1844, and mining has been conducted at the site for lead, cobalt, nickel, and copper at various times since then. National Lead mined the property from 1942 until 1961, when the property was sold. Anschutz Mining Corporation of Denver, Colorado currently owns the tract. Mines are being dewatered, but no mining operations are currently in progress. Copies of the expired NPDES permit and the proposed NPDES permit are in Appendix A-1.

There are several areas of mining tailings located at the site which contain metal tailings. There are two large tailings ponds located on-site. According to Randy Miller, Environmental Engineer for Anschutz, two tailings ponds and the major solid tailings areas on-site cover 98 acres. Further information such as total tonnage or volume of the tailings at the site was unavailable. However, given the total acreage covered by tailings, even if the depth of waste was only a few feet, the total volume would be large.

In November of 1980, the Environmental Protection Agency received a citizen's complaint that hazardous wastes were being deposited in mine shafts at the site. Rick Roberts and Dan Leyland, both of the Missouri Department of Natural Resources, inspected the mine in December of 1980 and found no evidence of illegal waste disposal at the site. In addition, water from the mines showed no evidence of chemical contamination.

F. R. Baser of N L Industries (formerly National Lead) notified the Environmental Protection Agency that the site was a potential hazardous waste site in June of 1981 due to the mining wastes and tailings disposed on-site.

In March of 1977, a dam between the southern tailings pond and Tollar Branch Creek collapsed after a heavy rain. Water and tailings flowed into Tollar Creek, Saline Creek, and the Little St. Francis River. A study of the stream after the collapse showed that the number of invertebrates was decreased due to the increased level of sediment in the water.* Heavy metal concentrations did not exceed safe limits for the invertebrates of concern. Concentrations of metals during the study never approached acute toxicity levels set by the Environmental Protection Agency. Also, no dead fish were observed following the dam collapse.

* "The Effects of Lead Mine Tailings on the Water Quality of Saline Creek and the Little St. Francis River, Madison County, Missouri", R. M. Duchrow and Linden Trid, Missouri Department of Conservation, 1980.

SITE INSPECTION

On January 25, 1983, TAT members Dave Cargo and Helen Holm inspected the Anschutz facility with Rick Roberts of the Missouri Department of Natural Resources Poplar Bluff Office. Randy Miller was present during the inspection.

A new dam has been built at the site to replace the one that collapsed in 1977. The new dam is 8 to 10 feet higher than the old dam, and is made of rock. The spillway is located on the north end of the dam. Some erosion of the spillway occurred as a result of the heavy rains of December 1982. This damage has been repaired and bids are being taken to concrete the spillway. The dam is located such that the only place that overflow from the spillway can go is into the Tollar Branch.

The new dam should prevent surface water contamination from the southern tailings pond. However, drainage from the northern pond areas is a concern. There are approximately 40 feet of difference in height between the two northern tailings ponds. There is a bluff consisting of bare soil between the areas (see Pictures #9 and #10 in Appendix 6). Erosion of this bluff during a heavy rainfall could result in a release of water, soil, and tailings into Saline Creek.

Anschutz is legally required to obtain a tailings pond permit from the Missouri Department of Natural Resources to certify the structural integrity of the dam. Under the regulations, Anschutz has six years to obtain this permit.

When the site inspection was performed, there was some snow on the ground. A visual inspection of the site area showed evidence of plentiful vegetative cover except on the surface of the tailings piles themselves. Also, the area downstream of the site did not differ from other land in the area.

CONCLUSION

There was no visible damage to the area downstream of the site, and there was a large amount of vegetation on the site itself. The only reported damage resulting from materials at the site occurred when the previous dam collapsed in 1977. A new dam is in place; the new dam is higher than the old dam and its structural integrity is improved. The new dam should prevent release of tailings from the southern tailings pond. However, this dam would not prevent a release from the northern tailings areas. It is recommended that Anschutz take steps to secure the northern tailings pond areas.

APPENDIX 1

NPDES Permit

File No. 3.500 Madison County NPDES Permit No. MO-0098752
Madison Mine - Anschutz Mining Corporation

December 11, 1981

Anschutz Mining Corporation
401 N. Mine LaMotte
Fredericktown, MO 63645

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

Dear Permittee:

Pursuant to the Federal Water Pollution Control Act, under the authority granted to the State of Missouri and in compliance with the Missouri Clean Water Law, we have issued and are enclosing your National Pollutant Discharge Elimination System (NPDES) Permit to Discharge from your above-referenced facility.

Please READ your Permit carefully: Your NPDES Permit to Discharge includes standard and special conditions which must be followed to remain in compliance with the requirements of the Federal Water Pollution Control Act and the Missouri Clean Water Law.

Monitoring reports required by the special conditions must be submitted on a periodic basis. Copies of the necessary report forms are enclosed. If you have any questions concerning these reports, please do not hesitate to call this office or our regional office in your area.

This NPDES Permit is both your Federal discharge permit and your new State operating permit and replaces all previous State operating permits for this facility. In all future correspondence regarding this facility, please refer to your NPDES Permit number, the facility name, and the file number listed at the top of this page.

I am sure that you appreciate the importance of eliminating pollution from our Nation's waters and will abide by the terms and conditions of the NPDES Permit. If you have any questions concerning this permit, please do not hesitate to call this office or our Regional Office at Poplar Bluff Regional Office, 948 Lester Street, Poplar Bluff, Missouri 63901, phone: (814) 785 0832.

Robert H. Hentges
Chief of Permit Section
Water Pollution Control Program

RHH/lsr

Enclosure

CC: EPA - Permit Branch
Billing Dept. - Permit Branch
Poplar Bluff Regional Office

MISSOURI DEPARTMENT OF
NATURAL RESOURCES

Permit No. MO-0098752
Applicant No. MO-0098752

MISSOURI CLEAN WATER COMMISSION
AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the Federal Water Pollution Control Act, Public Law 92-500, 92nd Congress, (Hereinafter, the Act) as amended, and the Missouri Clean Water Law, (Chapter 204 R.S. Mo. Cum. Supp. 1973, hereinafter, the Law),

Owner: Anschutz Mining Corporation

Owner's Address: 401 N. Mine LaMotte, Fredericktown, MO 63645

Facility Name: Madison Mine - Anschutz Mining Corporation

Facility Address: 401 N. Mine LaMotte, Fredericktown, MO 63645

Legal Description: SE¼, NW¼, Sec. 15, T33N, R7E, Madison County, MO

Receiving Stream & Basin: Goose Creek, Lower Mississippi River Basin (1006A)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001

Three 150 H.P. pumps each capable of delivering 1,000 GPM at a TDH of 450 feet, a shallow gradient meander of approximately 2,000 feet and all of the necessary appurtenances making these facilities complete and usable.

This permit shall become effective on December 11, 1981 . This permit may be appealed in accordance with Section 204.051.6 of the Law.

This permit and authorization to discharge shall expire at midnight, December 10, 1982.

ORIGINAL SIGNED BY
FRED A. LAFSER

Dated this 11th day of December, 1981.

Fred A. Lafser, Director
Department of Natural Resources
Permit Administrator for Missouri Clean Water Commission

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited, and monitored by the permittee as specified below:

Outfall Number and Effluent Parameter(s)	EFFLUENT LIMITATIONS Daily Maximum	Monthly Average	MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Units of Measurement	mg/l	mg/l		
Outfall #001				
Flow-m^3/Day (MGD)	*	*	monthly	24 hr. total
Non-Filterable Residue (Total Suspended Solids)	30.0	20.0	monthly	grab
Copper (Total)	.30	.15	monthly	grab
Zinc (Total)	1.50	.75	monthly	grab
Lead (Total)	.6	.3	monthly	grab
pH - Units	**	**	monthly	grab
Cadmium (Total)	.15	.10	monthly	grab
Oil and Grease	20.0	15.0	monthly	grab
Nickel	1.50	1.0	monthly	grab
Arsenic	1.00	.5	monthly	grab
Cobalt	*	*	monthly	grab

* Monitoring requirement only.

** pH is measured in pH units and is not to be averaged. The pH is limited to the range 6.0 - 9.0.

Special Condition: The permittee is to complete the monitoring requirements for priority pollutants prior to expiration of the permit.

Monitoring reports shall be submitted quarterly; the first report is due April 28, 1982.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

B. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I standard conditions dated October 1, 1980, and hereby incorporated as though fully set forth herein.

C. SCHEDULE OF COMPLIANCE -- Not applicable

D. SPECIAL CONDITIONS

1. This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under sections 301(b)(2)(C), and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitations so issued or approved:

   1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

   2. Controls any pollutant not limited in the permit.

   The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

2. The permittee shall complete the sampling and analysis to complete Clean Water Commission Forms 105A, 105C and 105D prior to expiration of the permit.

MISSOURI DEPARTMENT OF
NATURAL RESOURCES

Permit No. MO-0098752
Applicant No. MO-0098752

MISSOURI CLEAN WATER COMMISSION
AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the Federal Water Pollution Control Act, Public Law 92-500, 92nd Congress, (Hereinafter, the Act) as amended, and the Missouri Clean Water Law, (Chapter 204 R.S. Mo. Cum. Supp. 1973, hereinafter, the Law),

Owner: Anschutz Mining Corporation

Owner's Address: 401 North Mine LaMotte, Fredericktown, Missouri 63645

Facility Name: Anschutz Mining Corporation-Madison Mine

Facility Address: 401 North Mine LaMotte, Fredericktown, Missouri 63645

Legal Description: SE¼, NW¼, Sec. 15, T33N, R7E, Madison County

Receiving Stream & Basin: Goose Creek, Saline Creek
Lower Mississippi River Basin

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 - Three 150 horsepower pumps each capable of delivering 1,000 gallons per minute @ 450 TDH, a shallow gradient meander with three settling basins and appurtenances.

This permit shall become effective on . This permit may be appealed in accordance with Section 204.051.6 of the Law.

This permit and authorization to discharge shall expire at midnight,

Dated this day of

Fred A Sapper

Department of Natural Resources
Permit Administrator for Missouri Clean Water Commission

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective upon issuance and remain in effect until June 30, 1984. Such discharges shall be controlled, limited, and monitored by the permittee as specified below:

		INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
Outfall Number and Effluent Parameter(s)	Units	Daily Maximum	Weekly Average	Monthly Average	Measurement Frequency	Sample Type
Outfall #001						
Flow-m^3/Day	MGD	*		*	once/month	24 hr. total
Non-Filterable Residue (Total Suspended Solids)	mg/l	30		20	once/month	grab
Cadmium, Total	mg/l	.10		.05	once/month	grab
Copper, Total	mg/l	.30		.15	once/month	grab
Zinc, Total	mg/l	1.0		.50	once/month	grab
Lead, Total	mg/l	.60		.30	once/month	grab
Arsenic, Total	mg/l	1.0		.50	once/month	grab
Nickel, Dissolved	mg/l	*		*	once/month	grab
Cobalt, Dissolved	mg/l	*		*	once/month	grab
Iron, Dissolved	mg/l	*		*	once/month	grab
Oil and Grease	mg/l	20		15	once/month	grab
Temperature	°F	**		**	once/month	grab
pH - Units	SU	***		***	once/month	grab

* Monitoring requirement only.

** Beyond the mixing zone, water contaminants shall not raise or lower the temperature of a stream more than five degrees (5°)F. Water contaminants shall not cause or contribute to stream temperature in excess of ninety degrees (90°)F.

*** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0.

Monitoring reports shall be submitted quarterly ; the first report is due

There shall be no discharge of floating solids or visible foam in other than trace amounts.

B. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I standard conditions dated October 1, 1980, and hereby incorporated as though fully set forth herein.

C. SCHEDULE OF COMPLIANCE

See Page 5 of 5.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective July 1, 1984, and remain in effect until expiration of the permit. Such discharges shall be controlled, limited, and monitored by the permittee as specified below:

		FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
Outfall Number and Effluent Parameter(s)	Units	Daily Maximum	Weekly Average	Monthly Average	Measurement Frequency	Sample Type
Outfall #001						
Flow-m^3/Day	MGD	*		*	once/month	24 hr. total
Non-Filterable Residue (Total Suspended Solids)	mg/l	30		20	once/month	grab
Cadmium, Total	mg/l	.10		.05	once/quarter	grab
Copper, Total	mg/l	.30		.15	once/month	grab
Zinc, Total	mg/l	1.0		.50	once/month	grab
Lead, Total	mg/l	.60		.30	once/month	grab
Arsenic, Total	mg/l	1.0		.50	once/quarter	grab
Nickel, Dissolved**	mg/l	1.5		1.0	once/month	grab
Iron, Dissolved***	mg/l	1.5		1.0	once/month	grab
Cobalt, Dissolved	mg/l	****		****	once/month	grab
Oil & Grease	mg/l	20		15	once/month	grab
Temperature	°F	*****		*****	once/month	grab
pH - Units	SU	******		******	once/month	grab

* Monitoring requirement only.

** The nickel concentration in the effluent shall not elevate the concentration of dissolved nickel in the receiving stream above .100 mg/l beyond the mixing zone as described in the Missouri Department of Natural Resources Regulation "10 CSR 20-7.031, Water Quality Standards", Table A - Maximum Limitations for Designated Uses.

*** The iron concentration in the effluent shall not elevate the concentration of dissolved iron in the receiving stream above 1.0 mg/l beyond the mixing zone as described in the Missouri Department of Natural Resources Regulation "10 CSR 20-7.031, Water Quality Standards", Table A - Maximum Limitations for Designated Uses. Nor shall the discharge cause discoloration of the receiving stream by suspended or settleable iron.

**** The cobalt concentration in the effluent shall not elevate the concentration of dissolved cobalt in the receiving stream above 1.0 mg/l beyond the mixing zone as described in the Missouri Department of Natural Resources Regulations "10 CSR 20-7.031, Water Quality Standards", Table A - Maximum Limitations for Designated Uses.

Monitoring reports shall be submitted quarterly ; the first report is due

There shall be no discharge of floating solids or visible foam in other than trace amounts.

B. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I standard conditions dated October 1, 1980 , and hereby incorporated as though fully set forth herein.

C. SCHEDULE OF COMPLIANCE

See Page 5 of 5.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective July 1, 1984, and remain in effect until expiration of the permit. Such discharges shall be controlled, limited, and monitored by the permittee as specified below:

		FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
Outfall Number and Effluent Parameter(s)	Units	Daily Maximum	Weekly Average	Monthly Average	Measurement Frequency	Sample Type

***** Beyond the mixing zone, water contaminants shall not raise or lower the temperature of a stream more than five degrees (5°)F. Water contaminants shall not cause or contribute to stream temperature in excess of ninety degrees (90°)F.

****** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0.

Monitoring reports shall be submitted quarterly ; the first report is due

There shall be no discharge of floating solids or visible foam in other than trace amounts.

B. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I standard conditions dated October 1, 1980 , and hereby incorporated as though fully set forth herein.

C. SCHEDULE OF COMPLIANCE

See Page 5 of 5.

C. SCHEDULE OF COMPLIANCE

1. Conduct water quality sampling of Goose Creek below the mixing zone of the mine dewatering discharge, but above the stream confluence with Saline Branch. Sampling shall be for Dissolved Lead, Zinc, Nickel, Iron and Cobalt. Sampling shall consist of a minimum of three grab samples at least 7 days apart taken during normal mine dewatering discharge.

2. Submit results of water quality analysis and engineering report detailing proposed wastewater treatment improvements as necessary to produce an effluent in compliance with the final effluent limits and which will not cause violations of water quality limits by July 1, 1983.

3. If necessary, submit progress report on wastewater treatment improvements by April 1, 1984.

4. Comply with final effluent limits by July 1, 1984.

D. SPECIAL CONDITIONS

1. This permit shall be modified or alternatively revoked and reissued to comply with any applicable effluent standards or limitation issued or approved under Section 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

   a) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

   b) Controls any pollutant not limited in the permit.

   This permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

APPENDIX 2

Hazard Assessment

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION: VII | SITE NUMBER (to be assigned by HQ):

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (Section II). File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Madison Mine
B. STREET (or other identifier): 401 No. Mine La Motte
C. CITY: Fredericktown
D. STATE: Mo.
E. ZIP CODE: 63645
F. COUNTY NAME: Madison

G. SITE OPERATOR INFORMATION
1. NAME: Anschutz Mining Corporation
2. TELEPHONE NUMBER: (303) 825-6100
3. STREET: 2400 Anaconda Tower 555 17th Street
4. CITY: Denver
5. STATE: Colo.
6. ZIP CODE: 80202

H. REALTY OWNER INFORMATION (if different from operator of site)
1. NAME:
2. TELEPHONE NUMBER:
3. CITY:
4. STATE:
5. ZIP CODE:

I. SITE DESCRIPTION: Mining tailings are stored in tailings ponds and piles.

J. TYPE OF OWNERSHIP
☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE

II. TENTATIVE DISPOSITION (complete this section last)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.):
B. APPARENT SERIOUSNESS OF PROBLEM
☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE

C. PREPARER INFORMATION
1. NAME: Helen L. Holm
2. TELEPHONE NUMBER: (913) 621-6240
3. DATE (mo., day, & yr.): 3/11/83

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION
1. NAME: David Cargo
2. TITLE: TAT Leader
3. ORGANIZATION: Region VII Technical Assistance Team
4. TELEPHONE NO. (area code & no.): (913) 621-6240

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
David Cargo	Region VII Technical Assistance Team	(913) 621-6240
Helen L. Holm	Region VII Technical Assistance Team	(913) 621-6240

C. SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, residents)

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
W. Randall Miller	Environmental Engineer (314) 783-7223	401 No. Mine La Motte Fredericktown, Mo. 63645

Continued from Front

III. INSPECTION INFORMATION (continued)

D. GENERATOR INFORMATION (source of waste)

1. NAME	2. TELEPHONE NO.	3. ADDRESS	INDUSTRY	4. WASTE TYPE GENERATED
Anschutz Mining Corporation	(314) 783-7223	401 No. Mine La Motte Fredericktown, Mo. 63645	Mining	Tailings

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED
None			

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS
None		

G. DATE OF INSPECTION (mo., day, & yr.)	H. TIME OF INSPECTION	I. ACCESS GAINED BY: (credentials must be shown in all cases)
7/25/83	9 a.m.	☒ 1. PERMISSION ☐ 2. WARRANT

J. WEATHER (describe)

Overcast; temperature in the 30's; occasional snow flurries; ground was snow-covered

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER			
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL			
h. VEGETATION			
i. OTHER (specify)			

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.)

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

C. PHOTOS
1. TYPE OF PHOTOS: [X] a. GROUND [ ] b. AERIAL
2. PHOTOS IN CUSTODY OF: Region VII TAT

D. SITE MAPPED?
[X] YES. SPECIFY LOCATION OF MAPS: Region VII TAT

E. COORDINATES
1. LATITUDE (deg.-min.-sec.)
2. LONGITUDE (deg.-min.-sec.)

V. SITE INFORMATION

A. SITE STATUS
[ ] 1. ACTIVE (These industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)
[X] 2. INACTIVE (These sites which no longer receive wastes.)
[ ] 3. OTHER (specify): _____ (These sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?
[ ] 1. NO [X] 2. YES (specify generator's four-digit SIC Code): 1031

C. AREA OF SITE (in acres)

D. ARE THERE BUILDINGS ON THE SITE?
[ ] 1. NO [X] 2. YES (specify): Office and mining related

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X	A. TRANSPORTER	X	B. STORER	X	C. TREATER	X	D. DISPOSER
	1. RAIL	X	1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP	X	2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[ ] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL
[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLER/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE
[ ] 1. LIQUID [X] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS
[ ] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE
[X] 5. TOXIC [ ] 6. REACTIVE [X] 7. INERT [ ] 8. FLAMMABLE
[ ] 9. OTHER (specify):

C. WASTE CATEGORIES
1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.
Mining tailings

Continued from front

VII. WASTE RELATED INFORMATION (continued)

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT: 98
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE: Acres
X (1) PAINT, PIGMENTS	X (1) OILY WASTES	X (1) HALOGENATED SOLVENTS	X (1) ACIDS	X (1) FLYASH	X (1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	X (5) OTHER (specify): Tailings ponds and the major solid tailings area
			(6) CYANIDE	(6) OTHER (specify):	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER (specify)		

D. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE (place in descending order of hazard)

1. SUBSTANCE	2. FORM (mark 'X') a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY (mark 'X') a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT
Lead compounds	X			X						
Copper compounds	X									
Nickel compounds	X						X			
Cobalt compounds	X					X				
Zinc compounds	X					X				

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

☐ A. HUMAN HEALTH HAZARDS

None apparent

Continued From Page 4

VIII. HAZARD DESCRIPTION (continued)

B. NON-WORKER INJURY/EXPOSURE

None

C. WORKER INJURY/EXPOSURE

None

D. CONTAMINATION OF WATER SUPPLY

None documented

E. CONTAMINATION OF FOOD CHAIN

None documented

F. CONTAMINATION OF GROUND WATER

None documented

G. CONTAMINATION OF SURFACE WATER

A dam collapsed in 1977 on one of the tailings ponds. Tailings and water from the pond flowed into the Tollard Branch and into Saline Creek. A new dam has since been built that is structurally more sound than the previous dam. This dam will prevent contamination from the southern tailings pond. However, it appears that contamination could occur from the northern tailings pond areas.14

VIII. HAZARD DESCRIPTION (continued)

☐ H. DAMAGE TO FLORA/FAUNA

There was a reduction in the number of invertebrates in Saline Creek and in the Little St. Francis River after the dam collapsed in 1977. The new dam should prevent further incidents from occurring from the southern tailings area.

☐ I. FISH KILL

None documented

☐ J. CONTAMINATION OF AIR

None

☐ K. NOTICEABLE ODORS

None

☐ L. CONTAMINATION OF SOIL

None documented

☐ M. PROPERTY DAMAGE

None

Continued From Page 6

VIII. HAZARD DESCRIPTION (continued)

☐ M. FIRE OR EXPLOSION

None

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

None

☐ P. SEWER, STORM DRAIN PROBLEMS

None

☐ Q. EROSION PROBLEMS

None

☐ R. INADEQUATE SECURITY

No

☐ S. INCOMPATIBLE WASTES

None

VIII. HAZARD DESCRIPTION (continued)

☐ T. MIDNIGHT DUMPING

None

☐ U. OTHER (specify):

A new dam in place at the site should prevent additional surface water contamination from the site from the southern tailings pond. However, there is a potential for surface water contamination from the northern tailings areas.

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
1. IN RESIDENTIAL AREAS	4,300 -- Fredericktown and Cobalt Village			¼ mile (minimum distance)
2. IN COMMERCIAL OR INDUSTRIAL AREAS				
3. IN PUBLICLY TRAVELLED AREAS				
4. PUBLIC USE AREAS (parks, schools, etc.)				

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER (specify unit)	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
75 to 100 feet	No data available	Residences in Cobalt Village and in rural areas.
D. POTENTIAL YIELD OF AQUIFER	**E. DISTANCE TO DRINKING WATER SUPPLY (specify units of measure)**	**F. DIRECTION TO DRINKING WATER SUPPLY**
No data available	¼ mile to ¾ mile	

G. TYPE OF DRINKING WATER SUPPLY

☐ 1. NON-COMMUNITY < 15 CONNECTIONS ☒ 2. COMMUNITY (specify name): City Lake upstream of the site > 15 CONNECTIONS

☐ 3. SURFACE WATER ☒ 4. WELL -- Private wells in Cobalt Village and in rural areas

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')
	75-120ft.		X	

I. RECEIVING WATER

1. NAME: Tollar Branch

☐ 2. SEWERS ☒ 3. STREAMS/RIVERS ☐ 4. LAKES/RESERVOIRS ☐ 5. OTHER (specify):

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

The Tollar Branch flows into the Saline Creek. The Saline Creek is used as a water supply for livestock.

XI. SOIL AND VEGETATION DATA

LOCATION OF SITE IS IN:

☐ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☐ C. 100 YEAR FLOOD PLAIN ☐ D. WETLAND

☐ E. A REGULATED FLOODWAY ☒ F. CRITICAL HABITAT* ☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

*X	A. OVERBURDEN	*X	B. BEDROCK (specify below)	X*	C. OTHER (specify below)
	1. SAND		Lamotte Sandstone		Goss Soil
	2. CLAY		Bonneterre Dolomite		
	3. GRAVEL				

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH (100,000 to 1000 cm/sec.) ☐ C. HIGH (1000 to 10 cm/sec.)

☐ D. MODERATE (10 to .1 cm/sec.) ☐ E. LOW (.1 to .001 cm/sec.) ☒ F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

☐ 1. YES ☐ 2. NO 3. COMMENTS: No data available

H. DISCHARGE AREA

☐ 1. YES ☐ 2. NO 3. COMMENTS: No data available

I. SLOPE

1. ESTIMATE % OF SLOPE: Moderately rugged | 2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.

J. OTHER GEOLOGICAL DATA

Depth to bedrock ranges from 1 to 2 feet below surface to as much as 185 feet.

There are various types of soils in the area. Goss soil is the major type of soil in the steeper areas near the site. There is an underlying layer called [illegible] within 2 feet of the surface with a very low permeabi

* There are several endangered species in Madison County. The exact location of these species is not known.

Continued From Front

XIV. PERMIT INFORMATION

List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE (e.g., RCRA, State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X') 1. YES	2. NO	3. UNKNOWN
NPDES (Mine dewatering)	State of Missouri	MO-0098752	Dec. 11, 1982	Dec. 1982 *	X		
**							

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

☐ NONE ☒ YES (summarize in this space)

EPA received a citizen's complaint that industrial wastes were being deposited in mine shafts at the Madison County site. Rick Roberts of the Missouri Department of Natural Resources inspected the site in December 1980. There was no evidence of the alleged disposal.

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition *(Section II)* information on the first page of this form.

EPA Form T2070-3 (10-79) PAGE 10 OF 10

* They are filing for an extension of the NPDES permit.

** Anschutz will be applying for a tailings pond dam permit from the State of Missouri.

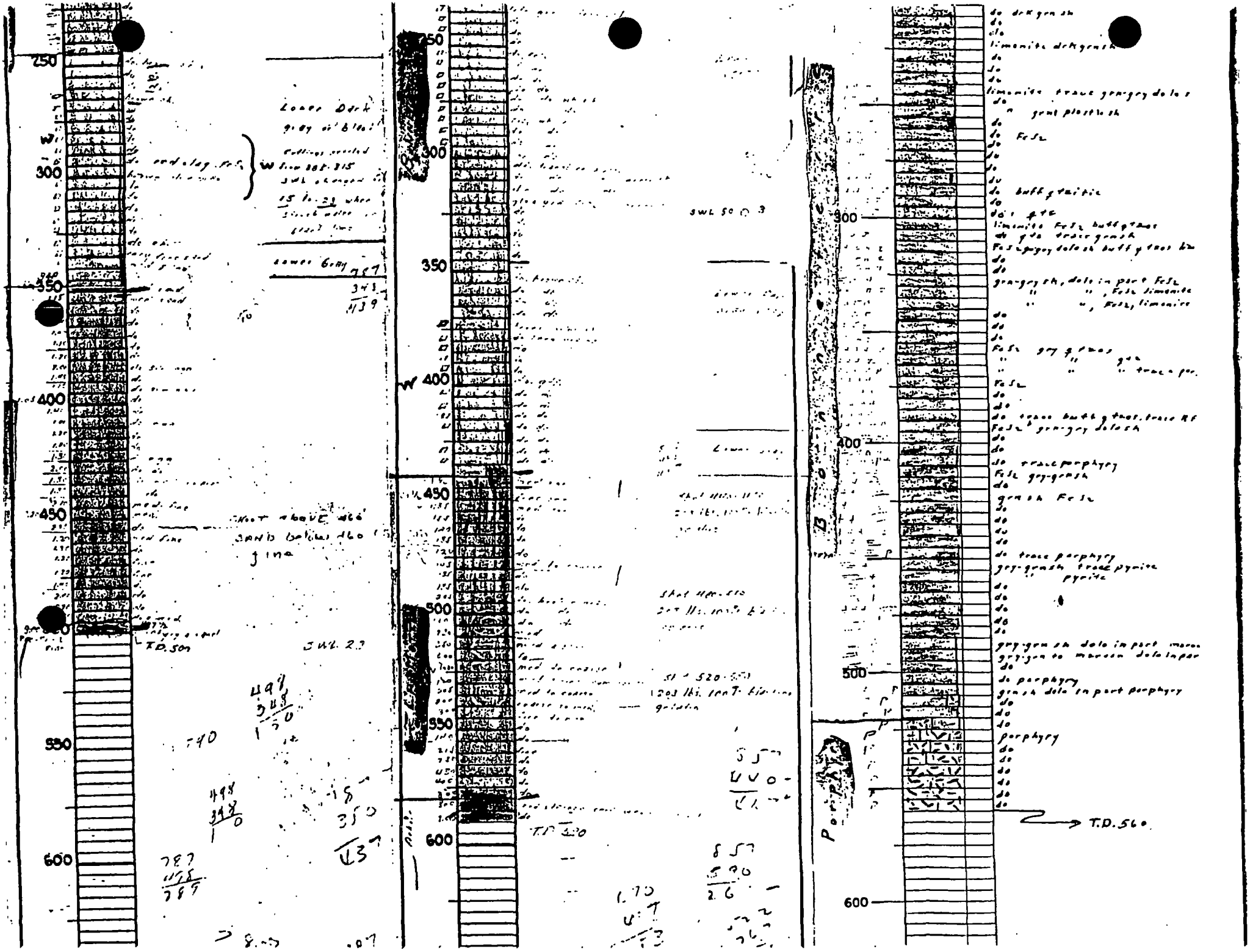
9/29/89

Pages 20-26 are
HRS Score Sheets.
They have been
transferred to
the NPL Files.

Greg Reesor
Missouri Coordinator
Pre-Remedial and
State Programs Section

APPENDIX 3

Endangered Species in Madison County


250
300
350
400
450
500
550
600
T.D. 560
T.D. 500

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.

MO SURVEY NO 8622	OWNER City of Fredericktown
COUNTY Madison	FARM / WELL NO 9
T 33 R 7E	DRILLER G. Clark
	DATE 7/20/44 – Comp 9/44
ELEVATION 717 Browning	PRODUCTION 75 G.P.M. muddy water. Hole abandoned.
	SAMPLES STUDIED Grohskopf – McFarland

REMARKS

750 ft almost due E of 9 R

Set liner at 325' in attempt to shut off muddy water without success. SWL 120 Res. to 195; Res. & orig. on down.

Dolomite

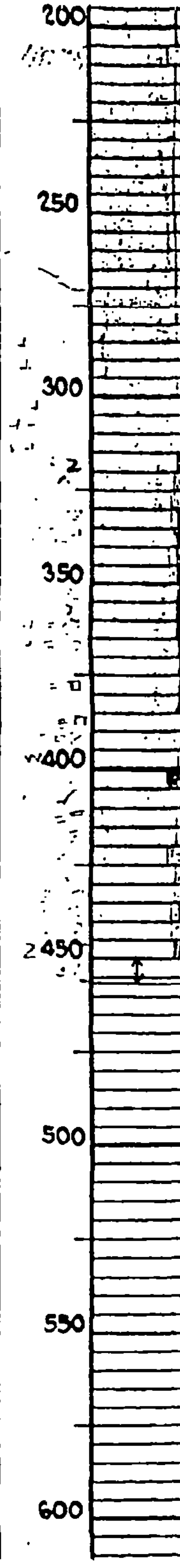
0
50
100
150
200

SAMPLES SAVED

Residual material ?

Note: 220-278 drilled very fast

BONNETERRE — Dolom.



dolo. green sh. – lam. ...
dolo. ... segment
... dolo. ... – lim...
do crevasse
do
do. limonite
do ... relief
do crevasse
... dolo. ... green sh.
do
do
do
do. limonite
do. Regary limonite
do crevasse
... dolo.
wh dolo. ... – lim ... green sh.

Note: 220-270 drilled very fast

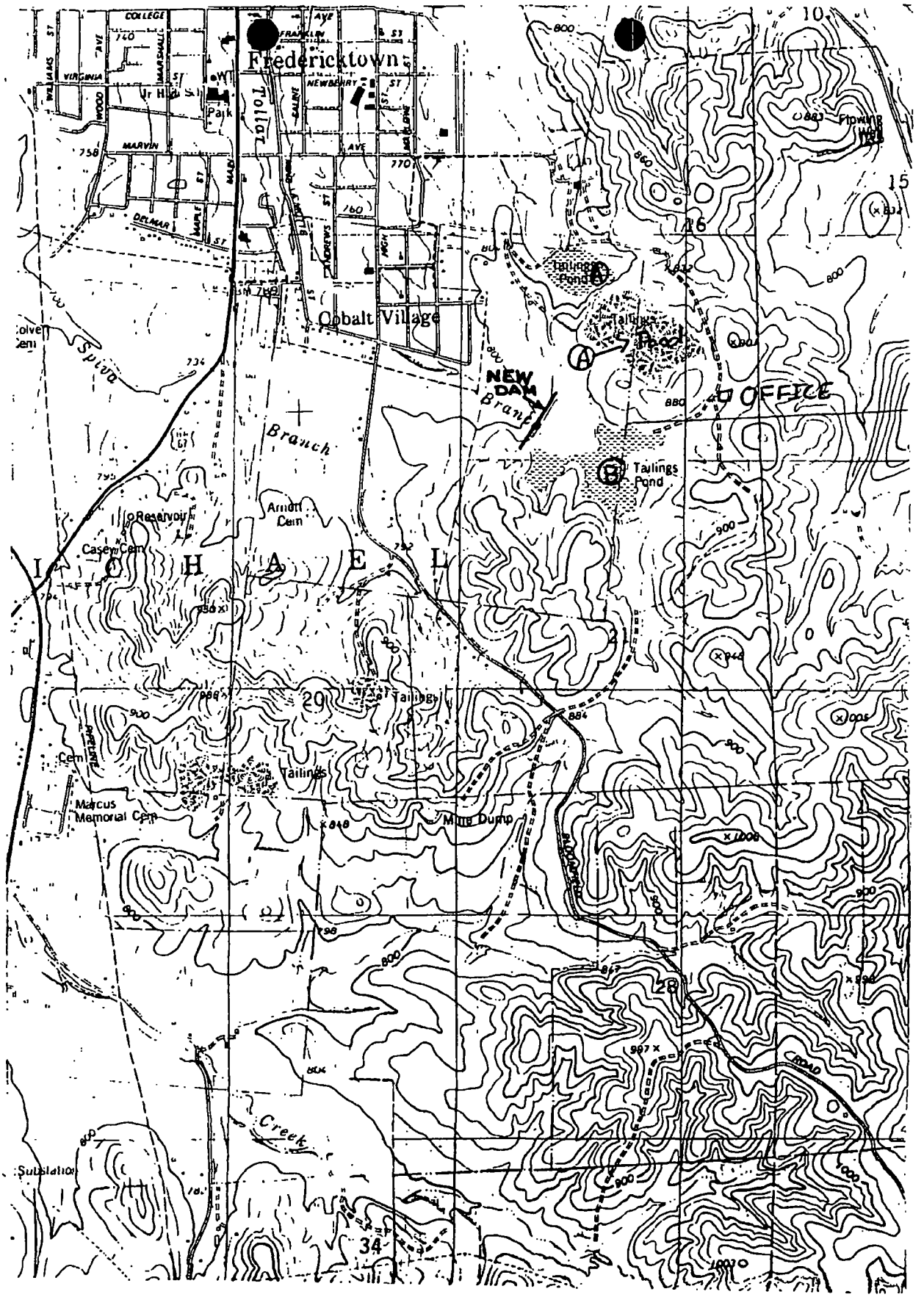
Note: 250-258 limonite

T.D. 457'

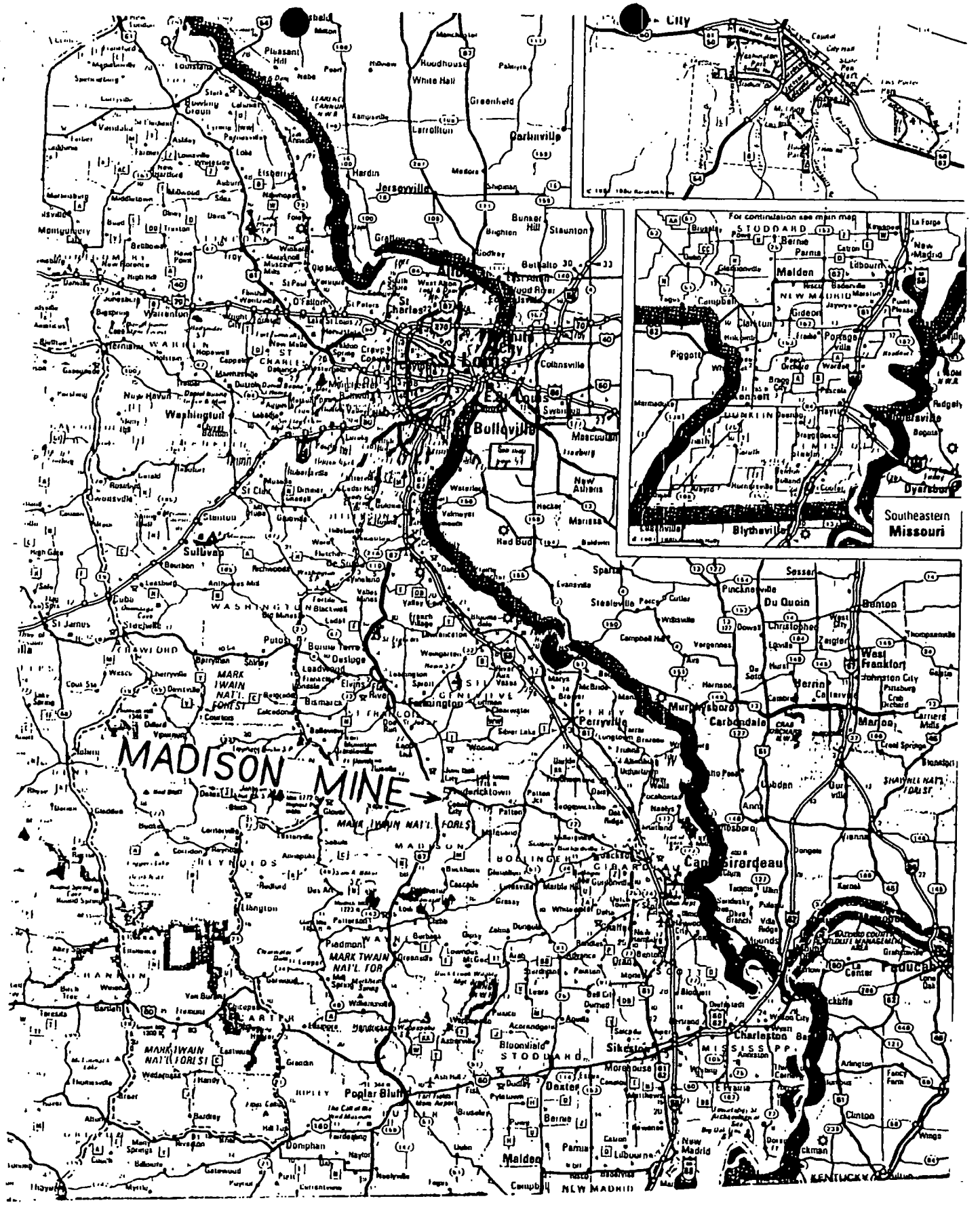
TD 457

APPENDIX 5

Maps



Site Location. Taken from the U.S.G.S. quandrangle map of Fredericktown, Missouri. N3730-W9015/7.5.



Madison Mine Location.

APPENDIX 6

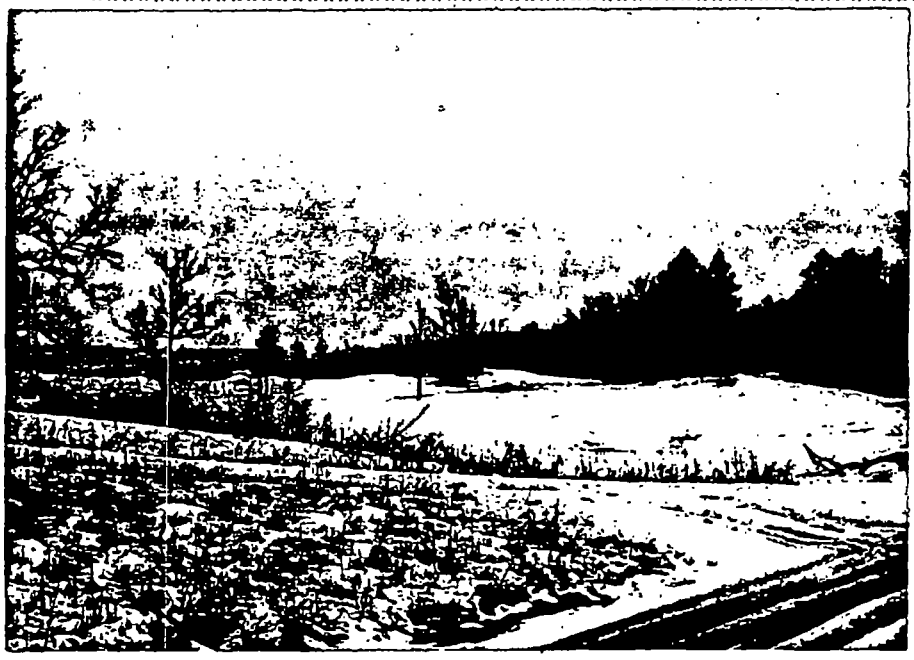
Photographs

ON SCENE PHOTOGRAPHS

Picture & No: 1
Date: Jan. 25, 1983
Time: 10:15 am
Photographer: David N Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens neg. #3
Direction: NE from office
Weather: Heavy overcast occasional snow flurries

Subject: Upper end of north tailings pond (to left)
Site: Madison Mine

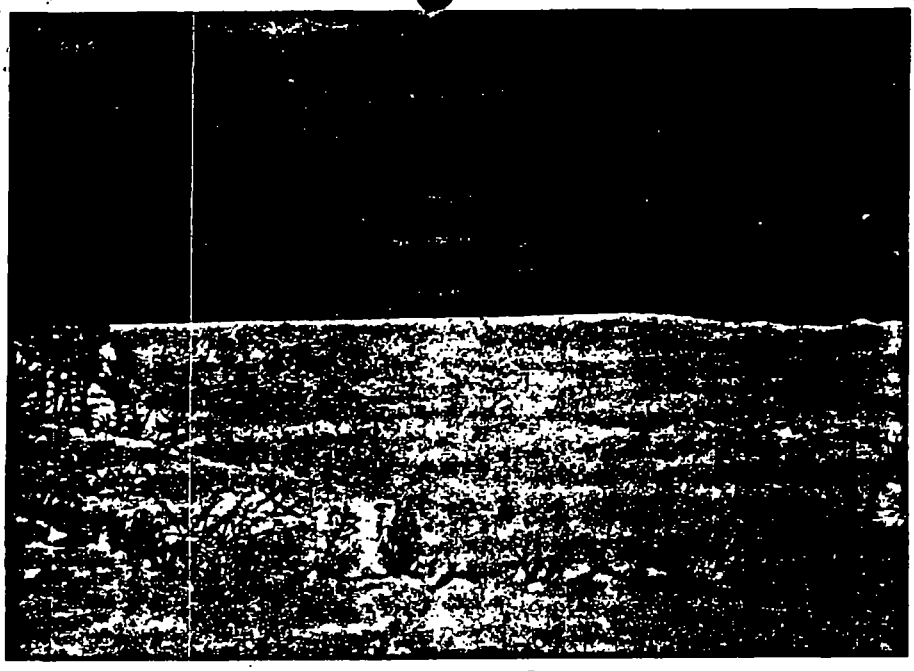
****



Picture & No: 2
Date: Jan. 25, 1983
Time: 10:18 am.
Photographer: David N. Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens neg. #4
Direction: N from just below office

Subject: Upper end of north tailings pond (A)
Site: Madison Mine

ON SCENE PHOTOGRAPHS



Picture & No: 3
Date: Jan. 25, 1983
Time: 10:25 a.m.
Photographer: David N. Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens
neg. #5
Direction: NNW

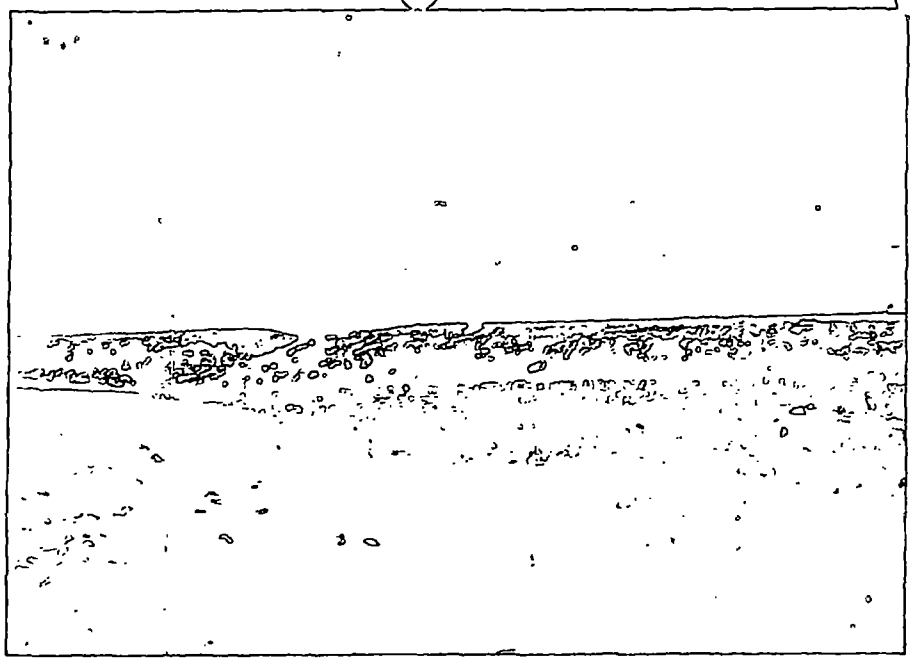
Subject: Upper Tailings Pond Ⓐ, n. of office
Site: Madison Mine

****

Picture & No: 4
Date: Jan. 25, 1983
Time: 10:45 a.m.
Photographer: David N Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens
neg #6
Direction: WSW

Subject: Tailings Pond Ⓑ, dike
Site: Madison Mine

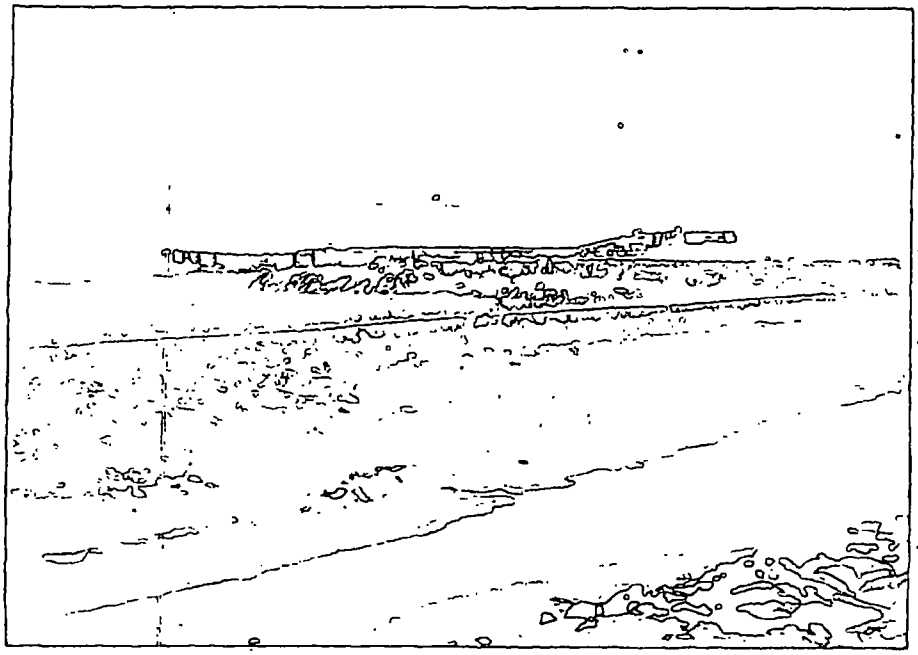
ON SCENE PHOTOGRAPHS



Picture & No: 5
Date: Jan. 25, 1983
Time: 10:45 am
Photographer: David N. Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens
neg #7
Direction: SW

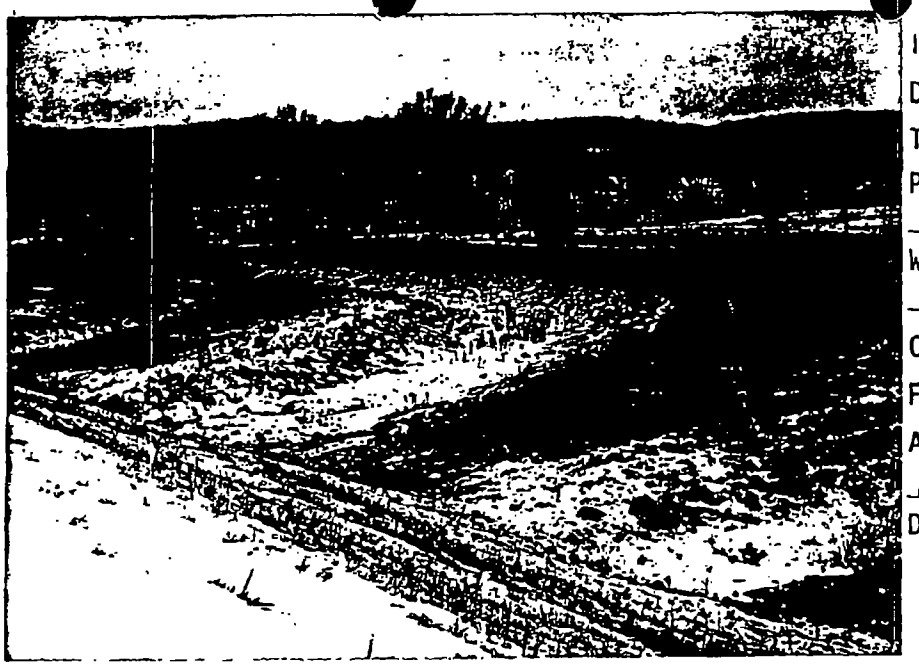
Subject: Newly constructed containment dike, Tailings pond (B); spillway is at left center (low spot)
Site: Madison Mine

****



Picture & No: 6
Date: Jan. 25, 1983
Time: 10:50 am.
Photographer: David N. Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens
Direction: SE

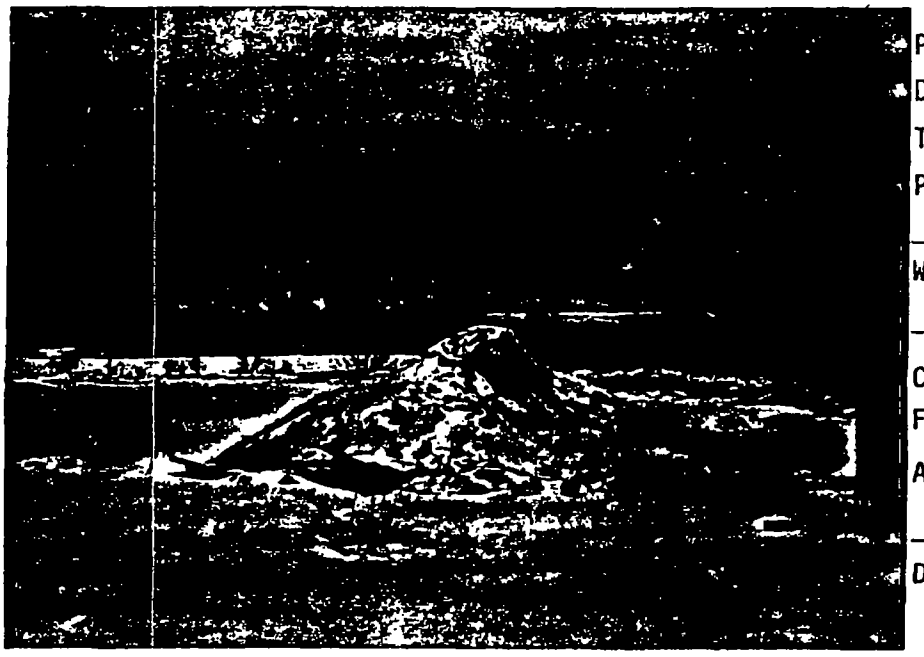
Subject: Tailings area (B), with old containment dike,
Site: View from Top of new dike
Madison Mine



Picture & No: 7
Date: Jan. 25, 1983
Time: 10:50 am.
Photographer: David N. Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens
neg #8
Direction: SW

Subject: Drainage channel below spillway, from dam, Tailings area (B)
Site: Madison Mine

****



Picture & No: 8
Date: Jan. 25, 1983
Time: 11:0 a.m.
Photographer: David N. Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens
neg #12
Direction: WNW

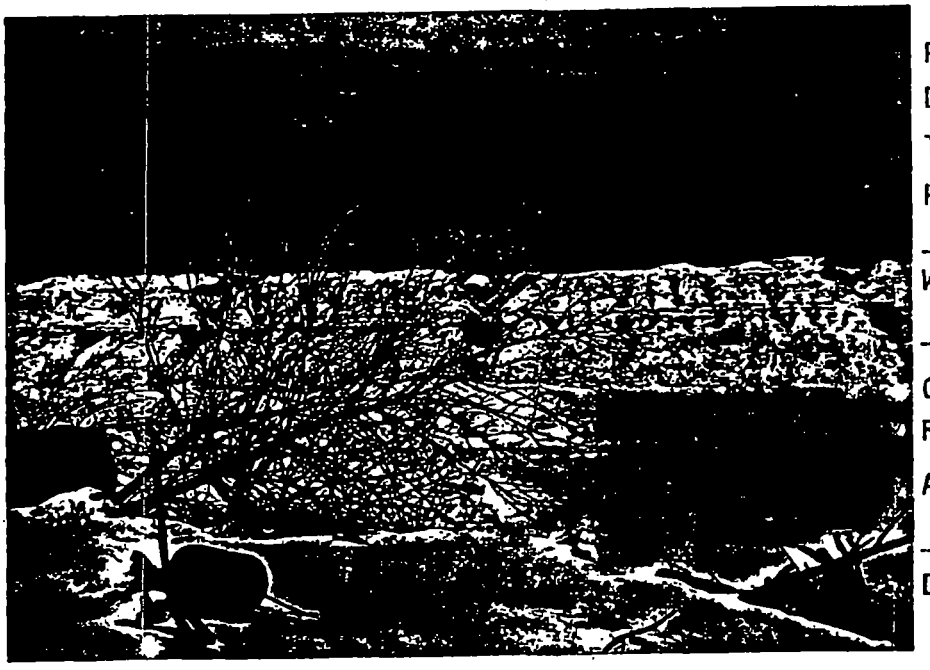
Subject: N. end of lower north Tailings pond
Site: Madison Mine

ON SCENE PHOTOGRAPHS

Picture & No: 9
Date: Jan. 25, 1983
Time: 11:15 am.
Photographer: David N. Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens
Direction: SW

Subject: Lower north tailings pond
Site: Madison Mine

****



Picture & No: 10
Date: Jan. 25, 1983
Time: 11:15 a.m.
Photographer: David N. Cargo
Witness: Helen Holm
Camera: Canon FTb
Film: ASA 400
Attachments: 50 mm lens
Direction: SSW

Subject: Lower north Tailings Pond, extension of
Site: photo above (to left)
Madison Mine

APPENDIX 7

Inspection Following Citizen's Complaint

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: III

SITE NUMBER (To be assigned by HQ): MO-0000100899

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II (Preliminary Assessment). File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION — site is SE of town

A. SITE NAME: Anschutz Mining Corporation

B. STREET (or other identifier): 401 N. Mine LaMonte Street

C. CITY: Fredericktown

D. STATE: Mo

E. ZIP CODE: 63645

F. COUNTY NAME: Madison

G. OWNER/OPERATOR (If known)

1. NAME:

2. TELEPHONE NUMBER:

H. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION

Hazardous wastes alledgedly being deposited in mines belonging to Anschutz. Inspection Dec. 18'80 by MDNR indicated no waste disposal.

J. HOW IDENTIFIED (I.e., citizen's complaints, OSHA citations, etc.)

Citizen's complaint

K. DATE IDENTIFIED (mo., day, & yr.):

L. PRINCIPAL STATE CONTACT

1. NAME: Rick Roberts

2. TELEPHONE NUMBER: 314-7[illegible]-0832

II. PRELIMINARY ASSESSMENT (complete this section last)

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☐ 3. LOW ☒ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION

☒ 1. NO ACTION NEEDED (no hazard)
Based on inspection Dec. 18, 1980 by Rick Roberts, MDNR

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☐ 4. SITE INSPECTION NEEDED (low priority)

C. PREPARER INFORMATION

1. NAME: Kerry Herndon

2. TELEPHONE NUMBER: FTS 758-6531

3. DATE (mo., day, & yr.): 2/12/81

III. SITE INFORMATION

A. SITE STATUS

☐ 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)

☐ 2. INACTIVE (Those sites which no longer receive wastes.)

☒ 3. OTHER (specify): facility in operation, but not as a disposal facility
(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

☐ 1. NO ☐ 2. YES (specify generator's four-digit SIC Code): N/A

C. AREA OF SITE (In acres)

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES

1. LATITUDE (deg.-min.-sec.):

2. LONGITUDE (deg.-min.-sec.):

E. ARE THERE BUILDINGS ON THE SITE?

☒ 1. NO ☐ 2. YES (specify):

EPA Form 2070-2 (10-79)

Continue On Reverse

Continued From Front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X	A. TRANSPORTER	X	B. STORER	X	C. TREATER	X	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

V. WASTE RELATED INFORMATION

A. WASTE TYPE

[ ] 1. UNKNOWN [ ] 2. LIQUID [ ] 3. SOLID [ ] 4. SLUDGE [ ] 5. GAS

B. WASTE CHARACTERISTICS

[ ] 1. UNKNOWN [ ] 2. CORROSIVE [ ] 3. IGNITABLE [ ] 4. RADIOACTIVE [ ] 5. HIGHLY VOLATILE
[ ] 6. TOXIC [ ] 7. REACTIVE [ ] 8. INERT [ ] 9. FLAMMABLE

[ ] 10. OTHER (specify): _____

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
X (1) PAINT/PIGMENTS	X (1) OILY WASTES	X (1) HALOGENATED SOLVENTS	X (1) ACIDS	X (1) FLYASH	X (1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	(6) OTHER (specify):	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER (specify)		

X

Continued From Page 2

V. WASTE RELATED INFORMATION (continued)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE *(place in descending order of hazard)*.

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD *(mark 'X')*	C. ALLEGED INCIDENT *(mark 'X')*	D. DATE OF INCIDENT *(mo., day, yr.)*	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH	X			
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY	X			
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL	X			
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING	X			
22. OTHER *(specify)*:				

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

☐ 1. NPDES PERMIT ☐ 2. SPCC PLAN ☐ 3. STATE PERMIT (specify): none
☐ 4. AIR PERMITS ☐ 5. LOCAL PERMIT ☐ 6. RCRA TRANSPORTER
☐ 7. RCRA STORER ☐ 8. RCRA TREATER ☐ 9. RCRA DISPOSER

☐ 10. OTHER (specify): _____

B. IN COMPLIANCE?

☐ 1. YES ☐ 2. NO ☐ 3. UNKNOWN

4. WITH RESPECT TO (list regulation name & number): _____

VIII. PAST REGULATORY ACTIONS

☒ A. NONE ☐ B. YES (summarize below)

IX. INSPECTION ACTIVITY (past or on-going)

A. NONE ☒ B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Site inspection	Dec 18 '80	State	No hazardous wastes found

X. REMEDIAL ACTIVITY (past or on-going)

☒ A. NONE ☐ B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment (Section II) information on the first page of this form.

REPORT OF INVESTIGATION
POTENTIAL HAZARDOUS WASTE DISPOSAL SITE
ANSCHUTZ MINING CORPORATION
FREDERICKTOWN, MISSOURI

January 15, 1981

On December 18, 1980, representatives of the Missouri Department of Natural Resources, Poplar Bluff Regional Office, conducted an investigation of the Anschutz Mining Corporation Property at Fredericktown, Missouri. This investigation was prompted by a citizen's complaint received via the Environmental Protection Agency. The complaint alleged industrial wastes are being illegally deposited in mines belonging to Anschutz Mining Corporation.

On December 17, 1980, at approximately 4:30 p.m. contact was made with Mr. Mike J. Brady via telephone in Denver, Colorado, who is the engineer for the Anschutz Mining Corporation operation at Fredericktown, Missouri. He indicated they had an office at 401 N. Mine LaMonte Street in town and we should contact Mr. Pat Barnes to arrange the site investigation. We advised Mr. Brady we would be at their office at 8:30 on December 18, 1980.

On December 18, 1980, we met Mr. Pat Barnes and Mr. Jim Karnes, representatives of Anschutz, at their office at 401 N. Mine LaMonte Street, Fredericktown. We proceeded from there to the mine property on the southeast side of town. We were advised the mine shaft had only been opened the previous day. The only openings to the mine were this shaft and the decline. We inspected both of these and there was no indication of any waste disposal. In fact, the mine was being dewatered at the time of our investigation and the water discharging from the pumps did not show any evidence of industrial chemical contamination.

A complete tour of the property was made and no evidence of any hazardous industrial wastes on this site was found.

Mr. Dan Leyland, Environmental Specialist, Poplar Bluff Regional Office, accompanied me on the investigation.

Submitted By:

Rick L. Roberts

Rick L. Roberts, P.E.
Environmental Engineer II

Approved By:

James A Burris

James A. Burris, P.E.
Regional Administrator

RLR/lh

cc: Mr. Pat Barnes, Anschutz Mining Corporation

EPA

POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
VII	MO 0000100 69

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Anschutz Mining Corporation	SE of town	
C. CITY	D. STATE	E. ZIP CODE
Fredericktown	Missouri	63645

II. FINAL DETERMINATION

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED	X				
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE (If yes, complete Section III.)					
C. REMEDIAL ACTION (If yes, complete Section IV.)					
D. ENFORCEMENT ACTION (If yes, specify in Part B whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

On December 18, 1980, representatives of the Missouri Department of Natural Resources, Poplar Bluff Regional Office, conducted an investigation of the Anschutz Mining Corporation Property at Fredericktown, Missouri. This investigation was prompted by a citizen's complaint received via the Environmental Protection Agency. The complaint alleged industrial wastes are being illegally deposited in mines belonging to Anschutz Mining Corporation. We were advised the mine shaft had only been opened the previous day. The only openings to the mine were this shaft and the decline. We inspected both of these and there was no indication of any waste disposal. In fact, the mine was being dewatered at the time of our investigation and the water discharging from the pumps did not show any evidence of industrial chemical contamination.

A complete tour of the property was made and no evidence of any hazardous industrial wastes on this site was found.

F. IF ... TI... ...IFY THE

H. PI... N... day, & yr.)

List ... tructions for a ... below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
Kerry Herndon - Preparer of form	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$ 46	

EPA Form T2070-5 (10-79)

Continue On Reverse

APPENDIX 8

Hazardous Waste Notification

NOT ON [illegible]

EPA Notification of Hazardous Waste Site

United States Environmental Protection Agency Washington DC 20460

8100609MOS94

MOS 000 000 100

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name: NL Industries, Inc.

Street: P.O. Box 1090 (Wyckoff-Mills Road)

City: Hightstown State: NJ Zip Code: 08520

B Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site: Madison Mine

Street: unknown

City: Fredericktown County: Madison State: MO Zip Code: 63645

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Baser, F.R., Dir. Environmental Control ~~Rodman, H.G., Environmental Engineer~~

Phone: 609/443-2411 or 2410

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1944 To (Year): ~~1976~~ 1974

E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☒ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☒ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☒ Other (Specify) Mine wastes

Source of Waste:
Place an X in the appropriate boxes.

1. ☒ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☒ Other (Specify) Co, Ni recovery (Cobalt, Nickel)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

EPA ARHM/HAZM

Notification of Hazardous Waste Site — Side Two

F Waste Quantity

Place an X in the appropriate boxes to indicate the facility types found at the site

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres

Facility Type

1 [X] Piles
2 [ ] Land Treatment
3 [ ] Landfill
4 [ ] Tanks
5 [X] Impoundment
6 [ ] Underground Injection
7 [ ] Drums, Above Ground
8 [ ] Drums, Below Ground
9 [X] Other (Specify) Unknown

Total Facility Waste Amount

cubic feet: Unknown
gallons:

Total Facility Area

square feet: Unknown
acres:

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

[ ] Known [X] Suspected [ ] Likely [ ] None

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

(2)

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

Mine wastes, and tailings, disposed at on-site. Notification made but uncertain regarding coverage of the statute

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing information the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other."

Name: ~~F. R.~~ Baser, F. R.
Street:
City: State: Zip Code:
Signature: F. R. Baser Date: 6/8/81

[ ] Owner, Present
[X] Owner, Past
[ ] Transporter
[ ] Operator Present
[X] Operator Past
[ ] Other

[FR Doc. 81-10111 Filed 4-16-81 8:45 am]
BILLING CODE 6560-29-C

MOD000000100

EPA POTENTIAL HAZARDOUS WASTE SITE IDENTIFICATION

REGION: 7 | SITE NUMBER: MO-0000000433

NOTE: The initial identification of a potential site or incident should not be interpreted as a finding of illegal activity or confirmation that an actual health or environmental threat exists. All identified sites will be assessed under the EPA's Hazardous Waste Site Enforcement and Response System to determine if a hazardous waste problem actually exists.

A. SITE NAME: Madison Mine

B. STREET (or other identifier):

C. CITY: Fredericktown

D. STATE: MO

E. ZIP CODE:

F. COUNTY NAME: Madison

G. OWNER/OPERATOR (If known)
1. NAME: F. R. Baser NL Industries
P.O. Box 1090 Hightstown, NJ 08520
2. TELEPHONE NUMBER: 609-443-2411

H. TYPE OF OWNERSHIP (If known)
[ ] 1. FEDERAL [ ] 2. STATE [ ] 3. COUNTY [ ] 4. MUNICIPAL [X] 5. PRIVATE [ ] 6. UNKNOWN

I. SITE DESCRIPTION

Site used from 1944 to 1974 by N.L. Industries, Inc.

J. HOW IDENTIFIED (i.e., citizen's complaints, OSHA citations, etc.)
Superfund Notification

K. DATE IDENTIFIED (mo., day, & yr.)
6/81

L. SUMMARY OF POTENTIAL OR KNOWN PROBLEM

Reported mine wastes & tailings disposed of on-site in piles & surface impoundment. Other wastes reported: inorganics, heavy metals, cobalt/nickel recovery.

Reported suspected release to environment.

M. PREPARER INFORMATION
1. NAME: Joy Haff
2. TELEPHONE NUMBER: 374-6531
3. DATE (mo., day, & yr.): 7/16/81

EPA Form 2070-8 (1-80)

RECORD OF COMMUNICATION

☐ PHONE CALL ☐ DISCUSS ☐ FIELD TRIP ☐ CONFERENCE
☐ OTHER (SPECIFY)
(Record of item checked above)

TO: Robert Landers EPA HQ 245-3051

FROM: Dave Crawford, TSS CR&A

DATE 12/7/81

TIME

SUBJECT 1. Madison Mine 2. ~~Anshutz~~ NATIONAL Mine Can Superfund Notification sites be delist

SUMMARY OF COMMUNICATION

I called Mr. Landers in EPA Headquarters on whether Superfund Notifications submitted in error (on wastes which were specifically excluded) can be delisted? Landers has been our contact on Superfund Notifications.'

Landers says that similiar questions have come RN up in most of the regions. They have been advising that they have no provision for delisting a Superfund Notification site, even if the notification was submitted in error-on a waste which was excluded.

Landers says that minig overburden which was put back into the mine site was excluded from SF notification. This sounds like it may describe the sites described on the notif cations submitted on the Madison Mine & the Anshutz Mine.

Landers says that headquarters is now in the process of providing the govenors of the st through the regions, with a list of the SF notification sites. Consequesntly even if the ion could deleist the site, the site would still appear on the list being provided by headquatters. Landers says on all of the lists provided there is a preamble saying that info provided on the S NOtification is preliminary ! that EPA will have to do an assess of the site to determine whether or not there is a hazard at the site. I said we had sim liar problems with our list of uncontrolle dsites before SF notification. What appears in the press is not likely to carry the preamble- The list may simply be published or broadcast by the press as a list of sites where hazardous wastes were disposed. Landers siad they were starting to realize that from similiar conversations with other regiosn.

To reiterate Landers says they have no provision for delisting a site turned in on a SF Notification, even if thed notification was submitted in error.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES TO:

EPA Form 1300-6 (7-72) REPLACES EPA NO FORM 8300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

RECORD OF COMMUNICATION

[X] PHONE CALL [ ] DISCUSSION [ ] FIELD TRIP [ ] CONFERENCE [ ] OTHER (SPECIFY)

(Record of item checked above)

TO: ~~Dave Crawford TSS CR&A~~

FROM: ~~John Goulias~~ 914) 645-3030

DATE: 12/10/81

TIME:

SUBJECT: Madison Mine   ~~Anshutz~~ Mine

SUMMARY OF COMMUNICATION

Superfund Notifications were submitted by N.L. Industries on mining wastes at the above sites. N.L. Industries is no longer owenr of the sites. Goulias has been arguing that SF Act can not address mining wastes. He also wants Region to take the sites off of the Superfund Site/uncontrolled site list. He says Jim Foil told him that if the perso who submitted the SF NOtification would send us a letter saying the notification was submitted in error we would take the sites off of the list.

We have receive a letter from N.L. Industries saying the notification was submitted in error & asking that the site be taken off of the lsit. I told Goulias we had received the letter from N.L. Industries but that it addressed only 1 of the 8 sites. Goulias asked for a copy of the letter. I suggested that the easiest way for him to get a copy of the letter was to contact the people that wrote the letter & ask them for a copy of the letter. Goulias did not want to do that. I said I could not jsut give him a copy of the letter. I said the proper thing for him to do to get the letter from EPA would be to request it through FOI. He said he had already made an FOI request on these sites. HOwever his FOI request was before EPA received the N.L. letter. Goulias indicated he would contact the regional office which handles FOI & see if he needed to send in a new FOI & if the letter he wanted could be released thorugh his old FOI request

I also told Goulias that we had contacted headquarters & that the preliminary indication we had gotten is that we could not take a SF notification site off the list even if the notification were submitted in error. I told him this was preliminary information & was not yet our final policay on this. Goulias says that other regions have taken such sites off the list.

Goulias is also sure that other regions have been told, and are following this guidance as policy, that mining wastes are excluded from being addressed through the Superfund Act. I said we have not yet received firm guidance on this either.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

I told Goulias I would call him when we had guidance on whether these mining wastes sites can be addressed through the Superfund Act & also if we can take sites off the list if the notification was submitted in error.

However we can expect that Goulias will continue to call every few days if we do not get guidance on this issues & are ~~xxxxxx~~ unable to answer his questions.

INFORMATION COPIES

TO: Katie   cc to Bob Marley

EPA Form 1300-6 (7-72)   REPLACES EPA HQ FORM 5300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

RECORD OF COMMUNICATION

[ ] PHONE CALL [ ] DISCUSS [ ] FIELD TRIP [ ] CONFERENCE

[ ] OTHER (SPECIFY)

(Record of item checked above)

TO: Dave Crawford TSS/OPA

FROM: John Goulias, Goulias Assoc. (314) 635-3?24

DATE

TIME

SUBJECT: 1. Madison Mine 2. National Mine SF notif.

SUMMARY OF COMMUNICATION

Goulias said he had spoken with Jim Foil about the SF notifications submitted by N.L. Industries on the Madison Mine & the National Mine. Goulias says Jim indicated that EPA might take these sites off the SF notification/uncontrolled site list. Apparently N.L. Industries was to send a letter to EPA saying that the SF Notifications were submitted in error, that the wastes disposed at these sites were mining wastes, excluddd from SF Notification requirements. Reportedly upon receipt of this letter from N.L. Industires EPA will take the names of the Madison Mine & the National Mine off of the SF Notification/uncontrolled site list.

Goulias wants to know if EPA has received this letter & if we will be delinting these 2 sites.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

12/7/81. We have received NL Ind. letter (told Dave this last week). Jim Foil in office today – recalls talking to Goulias about the mine site but <u>not</u> saying the site would be taken off the list.

KBriggs

INFORMATION COPIES

TO:

EPA Form 1300-6 (7-72) REPLACES EPA HQ FORM 5300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

APPENDIX 9

Site History

NL

August 12, 1982

CERTIFIED MAIL - RRR

Ms. Alice Fuerst
U.S. EPA, Region VII
324 E. Eleventh St.
Kansas City, MO 64106

Dear Ms. Fuerst:

In your letter, J. J. Franks, Jr., Regional Administrator to Mr. F. R. Baser, NL Industries, Inc., dated July 12, 1982, you requested information pertaining to the Madison Mine in Fredericktown, Missouri. As described in a subsequent letter, Alice C. Fuerst to Messrs. F. R. Baser and H. G. Rodman, NL Industries, Inc., dated August 3, 1982, it was agreed that NL would supply what requested information that could be located by August 16, 1982, with the remainder to follow by September 14, 1982. The information that could be located by this date is transmitted herewith.

I. Succession of Ownership of the Property.

a) The first shaft was sunk by Pomeroy in 1844, under the name of the Buckeye Copper Mine. A 500-ton shipment of ore, primarily copper sulfides was made. Operations were suspended in 1847. New efforts were made, and some small shipments of ores were made to Europe in 1860 and 1863.

NL Industries, Inc.
P.O. Box 1090, Hightstown, N.J. 08520 Tel. (609) 443-2410

Another unsuccessful attempt was made to operate in 1893.

b) North American Lead Company acquired the property in 1900. Cobalt-nickel-sulfides were produced in 1903, in addition to lead concentrates. New smelter and refinery works were completed in 1907. The company was declared bankrupt in 1910.

c) Missouri Cobalt Company purchased the property in 1916, and built a mill and a smelter. All operations were suspended in 1920. Production consisted of lead concentrates, copper, nickel, and cobalt. Refinery was reopened in 1922, and small amounts of cobalt were produced in 1922-1925.

d) The St. Louis Smelting and Refining Company, a division of National Lead Company (now NL Industries, Inc.) conducted exploration in the area from 1927 to 1931, and purchased the Schulte, O'Brien, Villars, Glaves, Oden, and Anthony tracts (NL has not yet discovered any further identification of these tracts). Prospecting was resumed in 1941-1944, on property leased from the

Missouri Cobalt Company. Operations were begun in 1944 to produce four concentrates: lead, copper, cobalt-nickel, and pyrites.

During the period from about 1942 to the 1950's, National Lead leased lands for mining purposes, and gradually acquired ownership of various parcels which made up the Madison Mine property. With respect to these lease/purchase records, the following documents have been located to date:

1) General Warranty Deed, 4-4-52, between Missouri Cobalt Company and National Lead Company, conveying surface rights only to listed real estate properties in Madison County.

Tract No. 1: 14.50 acres
Tract No. 2: 15.06 acres

"...except the stockpiles of mineral products now lying on the surface of the above-described real estate, to which stockpiles Missouri (Cobalt) retains full and complete title..." Refers to "...lease and option agreements between Missouri (Cobalt)

and St. Louis Smelting and Refining, each dated January 21, 1942...." "The conveyance of the surface rights, herein provided for is, however, made subject to the grants of easements made by Missouri (Cobalt) to Defense Plant Corporation, a corporation created by Reconstructive Finance Corporation, in certain agreements between Missouri (Cobalt) and Defense Plant Corporation dated 7-26-43..."

2) Termination of Lease dated 8-14-50, W.C. and U.L. Miller, of prior lease of 8-24-46, Madison Company properties in Madison County.

3) "Termination of Mining Lease", 1-26-51, refers to a Mining Lease dated 5-6-47 between J. M. and Mary Dowd and the St. Louis Smelting and Refining Company leasing land in Madison County to St. Louis Smelting and Refining.

4) "Termination of Lease" between National Lead Company and The Presbytery of Pittsburg, dated 8-21-50, terminating a mining lease

dated 8-11-49 for land leased in Madison County, Missouri.

5) Termination of Lease, 9-16-50, terminating land leased, dated 9-15-47 from Esther Warren, Madison County, Missouri.

6) Termination of Lease, 7-12-50, B. L. Tinnin and B. Tinnin, original lease of 10-15-48, Madison County properties.

7) Special Warranty Deed, 4-24-53, between Park City Consolidated Mines Company and National Lead Company conveying all of Park City's properties in Madision County, Missouri to National Lead, 477 acres, including an existing tailings pile.

8) Warranty Deed, Surface Rights, by M. R. and L. W. Ward to National Lead Company, Madison County property, with location, 1955.

9) Document of sale of equipment, as summarized below, originally bought by St. Louis Smelting and Refining from Missouri Cobalt

Company on 5-15-43, to the Defense Plant Corporation (U. S. Government), on 8-28-43:

Roaster Building and roaster
Briquetting buildings
Warehouse
Blast Furnace
Nickel Building
1 Wedge Furnace
Dust collecting system
Elevator, conveyors, bins, screens, tanks, and scales.

10) "Notice of Approval of Application" for purchase of Fredericktown Mill from War Assets Administration, 12-3-47.

The U. S. government was involved in operations at the Madison Mine site. In 1947, National Lead purchased from the War Assets Administration a milling plant at Fredericktown for processing crude ore. The Defense Minerals (Materials ?) Procurement Agency through the Metals Reserve Corporation financed construction of a refinery to separate and recover copper, cobalt, and nickel

stockpiles and the ore concentrates at Fredericktown. The new plant was leased to National Lead, and began operation in April, 1954 and continued until January, 1961.

In 1961, operations at the Madison Mine ceased. NL Industries sold the mine site, 1944 acres, in 1977, to Silas G. Dees of Marquard, Missouri, and John E. Walker of Fredericktown, Missouri.

e) NEDLOG Technology Group, Arvada, Colorado bought the Madison Mine from Silas Dees in 1978.

f) Anshutz Mining Corporation, Denver, Colorado bought the Madison Mine in 1979 and is reported to be the current owner.

2. Current Operations

We do not know the status of "current operations" at the mine. It is our understanding that there are no operations currently underway.

site, but we have not found any sampling or analysis data.

We are continuing our examination of files, and will report any additional findings by September 14, 1982.

Very truly yours,

H. G. Rodman
Principal Environmental Engineer

HGR/tb

Missouri Cooperative Extension Service

University of Missouri & Lincoln University

SOUTHEAST EXTENSION AREA

University of Missouri Extension
Courthouse
Fredericktown, Missouri 63645
314/783-3303

Bollinger, Cape Girardeau, St. Francois, Iron, Perry, Madison and Ste. Genevieve Counties

April 25, 1983

⇒ Distance from the site.

WESTON
Gateway 2 Building
Suite 224
4th and State Avenue
Kansas City, Kansas 66101

Attention: Ms. Helen Holm

Ms. Holm:

As requested, I'm enclosing a list of endangered species found in Madison County, Missouri. My source for the following list was a publication of the Missouri Department of Conservation and USDA-SCS entitled "Rare and Endangered Species of Missouri" 1977. There may be revisions to this 1977 list that I'm not aware of, so I would suggest you contact the Missouri Department of Conservation for the latest information.

Thanks for contacting Extension.

Respectfully,

Mel Zielinski
Area Agronomy Specialist

MZ/dh

Dept. of Conservation / Soil Service
1) Mike Martin – Field Agent
314-438-5945

Box 87 Mo. 63664
Potosi
⇒ Educational aspect of wildlife

Mo. Dept of Conservation
(314) 751-4115

Will get back Thursday

ANIMALS

Invertebrates

Stygonectes barri Holsinger
Orconectes quandruncus (Creaser)
Orconectes peruncus (Creaser)

Insects

Scirtetica aritensis (Rehn)

Pelecypoda - "Mussels"

Cyprogenia aberti (Conrad)
Potamilus purpuratus (Lamarck)
Villosa lienosa (Conrad)

Fish

Percina nasuta (Bailey)

PLANTS

Botrychium dissectum var. dissectum

Dennstaedtia punctilobula

Draba aprica

Dryopteris goldiana

Habenaria leucophaea

Heuchera missouriensis

Ilex verticillata var. padifolia

Isopterygium dischaceum

Lycopodium lucidulum var. lucidulum

Lycopodium selago var. patens

Marsupella sullivantii

Matelea obliqua

Seligeria donniana

Vitis rotundifolia

APPENDIX 4

Geological Information on the Fredericktown Area

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 250 Rolla, Missouri 65401 (314) 364-1752

April 25, 1983

Ms. Helen Home
WESTON
Gateway II Building
Suite 224
4th and State Avenue
Kansas City, KS 66101

Dear Ms. Home: Our File: Madison County
T. 33 N., R. 7 E.

This is in regard to our telephone conversation of April 22 concerning the geology and hydrology of the Fredericktown area.

I have copied several sample logs of wells in the immediate area which should help. On these logs, dolomite is green, sandstone is orange, chert is purple and igneous (Precambrian) is red. I've highlighted (yellow) the formation names.

The thickness of residuum (depth to bedrock) is highly variable, with thicknesses ranging between a few feet to as much as 185 feet. The Lamotte Sandstone is the best aquifer in the area, but smaller amounts of water are available in the overlying Bonneterre Dolomite in crevices and bedding planes. In places, the Lamotte is missing and the only horizons which are water bearing are in the Bonneterre.

The Lamotte directly overlies Precambrian igneous rock. Where the Lamotte is missing, the Bonneterre lies on Precambrian.

I have no information concerning soil permeability. Perhaps the SCS office for the area has this information.

When I may be of further assistance, please feel free to contact me.

Yours sincerely,

Don E. Miller, Chief
Water Resources Data & Research
Geology and Land Survey

DEM:djh

Enclosures

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.

MO SURVEY NO	OWNER	
8650	City of Fredericktown	
COUNTY	FARM At bend in road south of town along creek	WELL NO 9A
Madison		
T 33N R 7E	DRILLER G. Clark	
	DATE Comm. 10/19/44 - Compl. 11/44	
	ELEVATION 855	PRODUCTION Abandoned. 2.5 G.P.M. at 95; 8 G.P.M. at 305 - no casing; 15 G.P.M. at 476 - no casing
	SAMPLES STUDIED Allen R. Ostrander 10/23 - 11/29/44	

REMARKS No casing placed.
Location: At bend in road S of town along creek.

SAMPLES SAVED

0 — 50 — 100 — 150 — 200

wht. d. ... dol. ... ehl. ... green sh.
do - fine sand.
do - ...
do - ...
wht. d. - fine sand. - bituminous material
wht. d. - fine sand - green sh. dol.
Gray dol. sh. green sh. - R.F. sand -
Green dol. - grayglauc. dol. ...
Green dol. sh. - wht. d. chl. - bituminous mat.
do - few R.F. sand grains -
Green sh. - ... R.F. sand grains - wht. d. dol. ...
Green dol. sh. - R.F. sand grains -
Green dol. sh. -
do -
Green sh. dol. sh. - wht. d. dol. - few R.F. sand grs. -
Green sh. dol. green d. -
do - FeS_2
Green sh. dol. green sh. - wht. d. dol. chl. - FeS_2
do - abundant FeS_2
wht. d. gray glauc. chl. - green dol. sh. - ch. FeS_2 limonite
do - ... FeS_2 altering to limonite
do - ... - FeS_2 limonite
Green sh. dol. green sh. - wht. d. dol. gray glauc. - FeS_2
Gray glauc. chl. - green sh. dol. green d. - R.F. sand - FeS_2
Gray glauc. sh. ... - green sh. - FeS_2
Gray glauc. sh. ... with ... green sh. - FeS_2
do - FeS_2
do - FeS_2 - limonite.
do - FeS_2
do - ... R.F. sand, FeS_2
do - FeS_2
do - FeS_2
do - brown dol. sh. - bituminous material - FeS_2 -
do - FeS_2 R.F. sand grains - no ground.
do - FeS_2
do - FeS_2
Gray dol. sh. - gray glauc. dol. chl. ... - R.F. sand grains
do - FeS_2 - pink feldspar.
do - FeS_2
Gray glauc. dol. chl. - gray & br. dol. sh. - R.F. ... - FeS_2
do - FeS_2
do - FeS_2
do - FeS_2
do - FeS_2 - ... qtz.
do - FeS_2
do - FeS_2

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO

MO SURVEY NO	OWNER	
4939	CITY OF FREDERICKTOWN	
COUNTY	FARM 1½ blocks west and ½ block S. of Court House	WELL NO 6.
Madison		
T 33 R 7E	DRILLER Clark & Johnson	
	DATE July 1938	
	ELEVATION 733 City Eng.	PRODUCTION
	SAMPLES STUDIED Grohskopf 7-28-38	

REMARKS

SWL = 10' before csg.

SAMPLES SAVED

733
575
425
1733
365
2078

0 — 50 — 100 — 150 — 200

T.D. 257

STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER	
10257	Park City Cons. Mines C	
COUNTY	FARM	WE
Madison	East	E
T 33 R 7E	DRILLER	
	DATE	
	ELEV. 788	PROD. Mineral Prosp
	LOGGED BY 8/9/48 J. James	

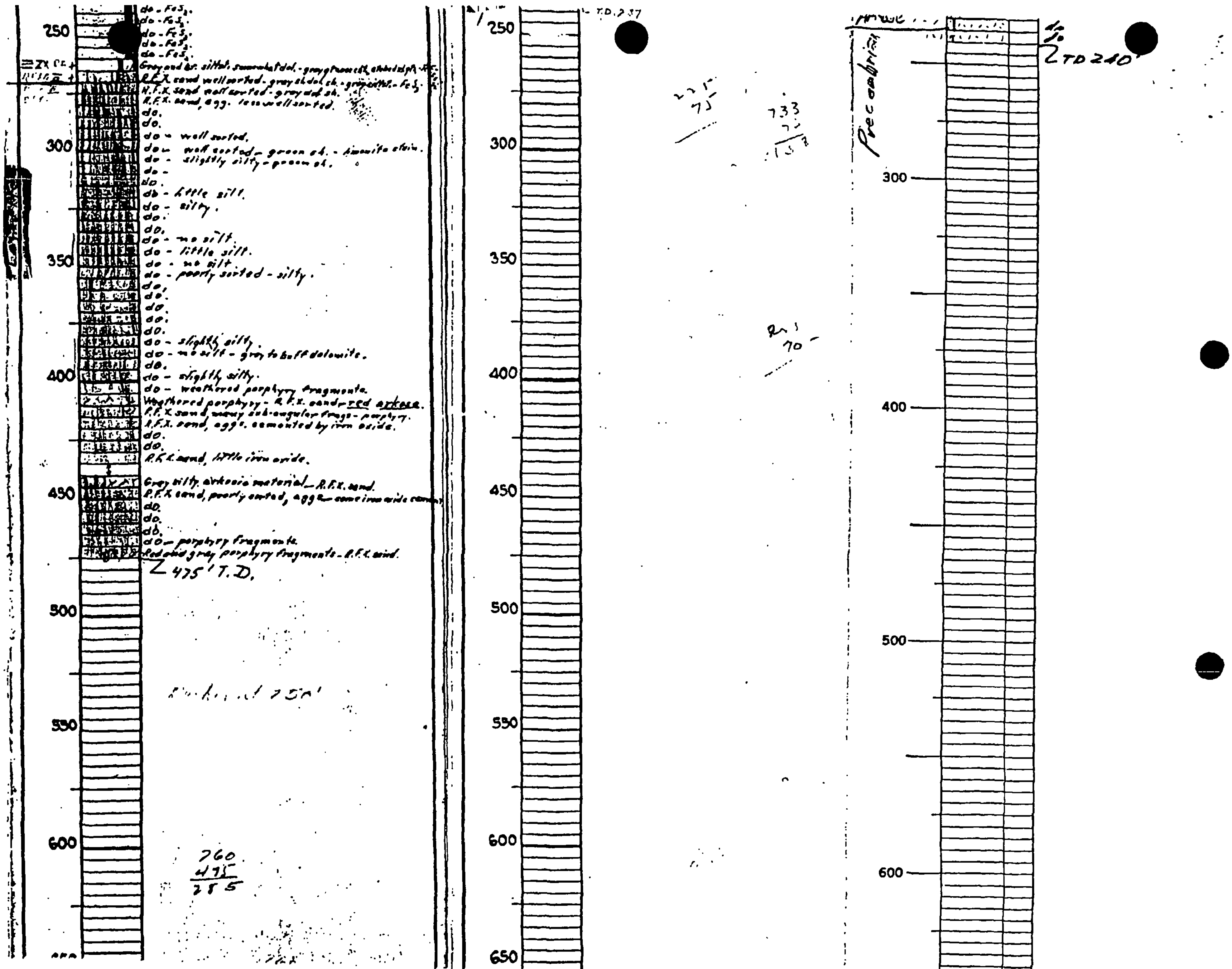
REMARKS

Bonneterre

100 — 200

gray sh. ... dol.
chl. gray sh. - sand
gr. sh. - gl. sand.
gl. sand.
gr. dol. sh.
do gl.
gr. dol. sh.
do
do
do
do - gl.
do
do
do
do
gr. sh. - FeS_2
FeS_2 - gr. sh. - sand
gl. - aug. sand FeS_2
do
do
gl. - aug. sand - FeS_2
do
do
do
do
do
do dk. sh.
do
do
do
do
do
do
gl. - aug. sand - sand - Fe
do
do
do
Porphyry
do

Arkose


250
300
350
400
450
500
550
600
do - FeS_2.
do - FeS_2.
do - FeS_2.
do - FeS_2.
do - FeS_2.
Gray and br. silty, somewhat dol. - gray green silty shale
R.F.X. sand well sorted - gray sh. dol. sh. - gray silty - FeS_2.
R.F.X. sand well sorted - gray dol. sh.
R.F.X. sand, agg. less well sorted.
do.
do.
do - well sorted.
do - well sorted - green sh. - limonite stain.
do - slightly silty - green sh.
do -
do.
do - little silt.
do - silty.
do.
do.
do - no silt.
do - little silt.
do - no silt
do - poorly sorted - silty.
do.
do.
do.
do.
do.
do - slightly silty
do - no silt - gray to buff dolomite.
do.
do - slightly silty.
do - weathered porphyry fragments.
Weathered porphyry - R.F.X. sand - red arkose.
R.F.X. sand, many sub-angular frags - porphyry.
R.F.X. sand, agg. cemented by iron oxide.
do.
do.
R.F.X. sand, little iron oxide.
Gray silty arkosic material - R.F.X. sand.
R.F.X. sand, poorly sorted, agg - some iron oxide cement
do.
do.
do.
do - porphyry fragments.
Red and gray porphyry fragments - R.F.X. sand.
475' T.D.
760
475
285
T.D. 237
250
300
350
400
450
500
550
600
650
733
Precambrian
TD 240'
300
400
500
600

Madison

T	R	DRILLER	
34N	7E	DATE	January
SE - NW			

ELEV. 935 (Fuller)

PROD. Mineral Test

LOGGED BY McCracken 1-10-49

REMARKS

Released per NL letter 2-14-77 WB

Residual cht. to 150 ft
wh. cht. dense
do
do sol.
do sol. { Resid. clay etc.
dense & sol.
do
do
do
do
Dense gr. clay
do
do x 2th
do
do
do Xline ch.
do
do
do . RF Sand
do
f. Sand. agg. glauconite
do
First Action
f. Sand. glauconite
do
do
red. clay
do
f. Sand. green sh.
do
do
do
green sh.
do
do
do dol. sh.
green sh. dolomorph
f. sand

100

200

[redacted]

[redacted]

ME 11,7__ National Lead Co.

COUNTY	FARM	WELL NO.
Madison		RY-31

T	R
33	7E

Section 26

DRILLER

DATE Feb 1951 ?

ELEV. 954.9 Nat. Lead

PROD. Mineral test

LOGGED BY S. Marinkovic Nov. 17, 1951

REMARKS 270' E & 187' N of ___ NW 1/4

f.s. sand
do
do
do
do
do
f.s. sand, gr. dolocasts
gr. dolocasts
do
do
gr. shale
gy. shale
do
do
gr. shale
do
do
do
do
do
do
gy. shale
gr. shale
do
gr. dolocasts
do
gr. shale, glauconite
gr. shale, FeS2
do
do
do
do
do
do
do
do
do
do
do
gr. dolocasts, FeS2
do
FeS2
do
gr. shale, FeS2
do

100

200

[redacted]

9E25

St. Joseph Lead Co., Fredericktown, Missouri

COUNTY	FARM	WELL
Madison		

T	R
33N	7E
SW	NE

Section 27

DRILLER Batter; Carter J. Reyno

DATE 10-29-47

ELEV. Nat. Lead 975.42

PROD. Mineral Prospect

LOGGED BY File 1-29-48

REMARKS

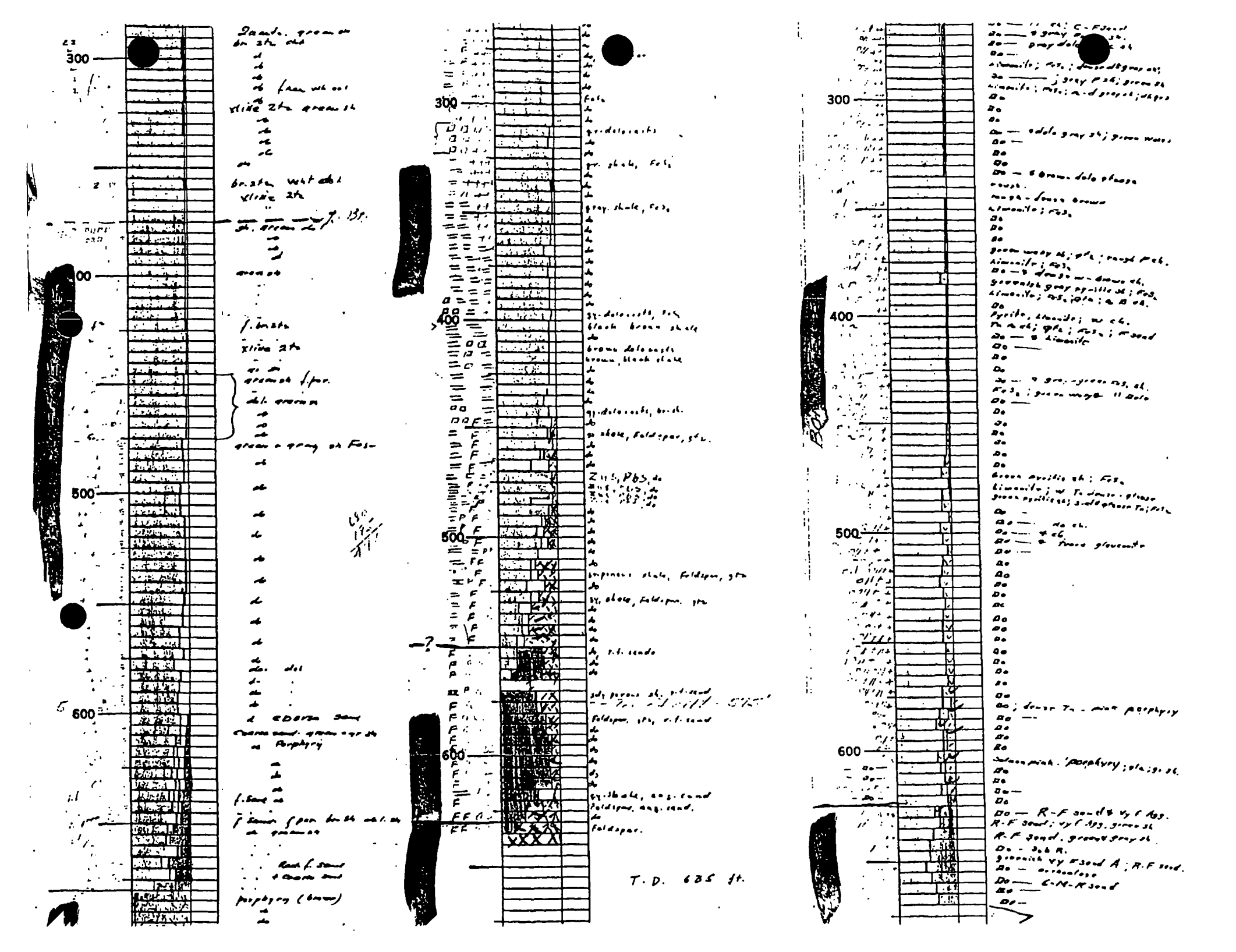
Released per NL letter 2-14-77 WBH

Fine oolites; sdy. & chert; powder
Do
Do — & c.R sand
Do
Do
Do
Do — dolocasts
Do
Do
Do
sandy, dolocasts.
Do
Do
Do
Do
Do
Do
Do
Do
Do
Do
Do — & dense gray
Do
Do
Do
Do
Do
Do
Do
Do
Do
Do
Do
sand aggreg.(clay cement) s-dol
To silt.
Do — W dense sh.
Dolo rough, dense; gla
Do
Do — clayie silt.
green magy. sh; dolocst; gla
Do — roughes.
Do
Do
Do — more green sh
Do
Do — & FeS2
Limonite round
Do — & green magy sh.
Do
Do
Do — & FeS2
Do
Do — & plane sh; gla; m sand
Do — & FeS2; C-FeS2

100

200

[redacted]


300
400
500
600
T. D. 635 ft.

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.

MO SURVEY Nº	OWNER	
5392	City of Fredericktown	
COUNTY	FARM	WELL Nº
Madison	Isbell	8
T 33 R 7E	DRILLER Clark & Johnson	
	DATE May 23, 1939	
20	ELEVATION 787	PRODUCTION [redacted] G.P.M.
	SAMPLES STUDIED Grohskopf	

REMARKS: 90 ft of 8" csg SWL 115

Well made 75 G.P.M. before shooting, pump intake @ 366 ft.
Well shot with 200 quarts of solidified nitro, shot from 460½ to 498½, 7 shells, 5½ ft long
made 85 G.P.M. after shooting

SAMPLES SAVED

0, W, 50, W, 100, W, 150, 200

MO SURVEY Nº	OWNER	
5390	City of Fredericktown	
COUNTY	FARM	WELL Nº
Madison	Isbel (Formerly Chapman)	7
T 33N R 7E	DRILLER Clark & Johnson	
	DATE Feb – April 1939	
20	ELEVATION 857.19 (Level)	PRODUCTION [redacted]
	SAMPLES STUDIED Grohskopf	

REMARKS 187' of 8" I.D. csg
Bottom Suction 366, Bottom of bowls 346
Breaks Suction above 55 G.P.M. 27 hr. test.
Static Water Level before csg 50 ft. Well was cased after drilling to 590 ft. and after shooting Lamotte sand. Final SWL 80 ft.

SAMPLES SAVED

857
575
...
857

0, 50, W, 100, W, 150, W, 200, 250

RELEASED

STATE OF MISSOURI
DIVISION OF
GEOLOGICAL SURVEY AND WATER RESOURCES

LOG NO.	OWNER	
9817	St. Louis Smelting & Re	
COUNTY	FARM	WELL
Madison	Ryan	RY
T 33 R 7E	DRILLER C. A. Johnson	
SW SE	DATE 11/12/47 12/2/47	
23	ELEV. 988 (Filler)	PROD.
	LOGGED BY 1/18 McNeal	Mineral test

REMARKS 167' of 6¼"

Released per Wi letter 2-14-77 WBH

SWL 155

wh sm, d, q tzos Fe...
do
do ool
wh sm d q tzos
do
do ool free frosted ool RF
do
do
do
wh sm, d, q tzos, ool, dolo, ferro...
do
do
wh sm, d, q tzos Fe...
do drusy
do
do
do
gry sm q tzos wh q tzos, drusy
wh dolo, ool, q tzos, drusy
wh dolo q tzos drusy
tan q tzos wh q tzos gry sm
do
do
tan q tzos wh q tzos gry
q tz wh q tzos RF
brn q tzos
wh q tz free & aggregates
wh q tzos
do
q tz
limonite
limonite
Fe S wh q tzos
do arsenite
limonite
Fe S
do
do
do drk gry sh
do
do
limonite drk gry sh
do
do

100, 200, W